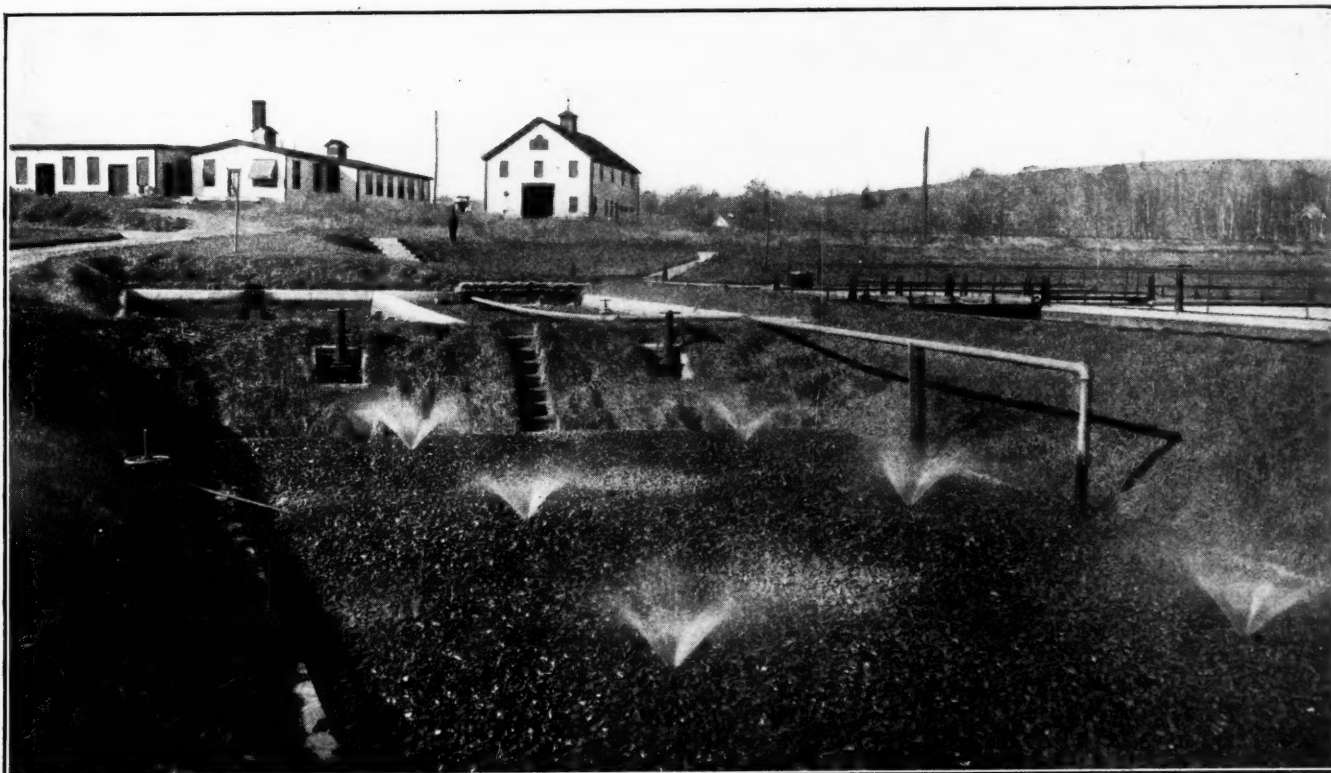


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EXPERIMENTAL SPRINKLING FILTER AT WORCESTER, MASS.

SEWAGE TREATMENT AT WORCESTER, MASS.

General Features of Plant at Present Time—Figures for the Year 1910—Experiments with Sprinkler Filters—
Effect of Depth—Comparison with Sand Filters—Seasonal Variation in Effluent

Abstracts from Annual Report of City Engineer Frederick A. McClure.

THE city of Worcester, Mass., is required, by statute, to "remove from its sewage, before it is discharged into the Blackstone River, the offensive and polluting properties and substances therein, so that after its discharge into said river, either directly or through its tributaries, it shall not create a nuisance or endanger the public health."

The first problem, the removal and disposal of the suspended matters, was effectively solved by the adoption of chemical precipitation and sludge pressing, the sludge-cake being used, mainly, for filling up a large swampy area.

As time went on it became apparent that under existing conditions the removal of suspended matters alone was not satisfying all of the requirements. Accordingly, steps were taken towards the solution of the second problem, the oxidation of the dissolved organic matters, by providing intermittent sand filters.

The area now available for this purpose amounts to nearly 75 acres. Upon this area it is possible to treat an average of 40 per cent. of the organic matter of the entire sewage with very satisfactory results.

While it will probably never be essential at Worcester to take the final step of sterilization of the sewage effluent, it will undoubtedly be necessary to continue to provide means for the bacterial purification of the sewage.

The strongest sewage is treated on the sand filters up to their capacity. The remainder is treated by chemical precipitation, except a relatively small amount applied to sprinkler filters. During the year 9,810,000 gallons per day were treated by chemical precipitation, 4,720,000 gallons by sand filtration and 40,000 by experimental sprinkler filters, these being the averages for the year.

Chemical precipitation required the use of 1770 tons of lime,

or 989 pounds per million gallons of sewage treated. This effected a 77.8 per cent. removal of albuminoid ammonia. The sludge amounted to 15,946,000 gallons, which was pressed into 13,217 tons of sludge cake. The quantity of sewage treated on the 64.7 acres of sand filters averaged 73,000 gallons per acre daily.

Preliminary to filtration the crude sewage is passed through a tank which provides a period of about 30 minutes for sedimentation. From this tank there have been removed 6,850,000 gallons of sludge containing 1071 tons of dry solid matter. This sludge has been pumped to the sludge beds, as during the previous year.

The total purification effected by this treatment in terms of albuminoid ammonia amounts to 87.3 per cent of the total organic matter and 64.4 per cent of the dissolved organic matter.

The deposit removed from the surface of the beds has amounted to 17,155 cubic yards, which is equivalent to 265 cubic yards per acre and 10.0 cubic yards per million gallons of sewage filtered. The cost of cleaning was approximately \$4,700, or 27.4 cents per cubic yard.

Owing to the periodical clogging of the underdrains, due largely to the precipitation of iron, as explained in previous reports, there have been laid this year approximately 11,000 feet of new drains in nine beds at a cost of about \$5,070. The cost of this work was greater than last year, principally because of the stumps and stones and muck in the paths of several drains.

The net cost of maintenance of the purification works for the fiscal year, including all administrative expenses, amounts to \$49,908.67, or 34.2 cents per capita. The cost of purification may be subdivided as follows:

	Total.	Per Million Gallons.
Chemical precipitation.....	\$18,802.19	\$5.25
Sludge pressing.....	16,208.41	4.53
Sand filtration.....	14,898.07	8.65

EXPERIMENTAL SPRINKLER FILTER.

During the first two years of operation of the experimental sprinkler filters, septic tank effluent was applied under varying conditions and at various rates. The results of these experiments have been published in previous reports.

The results of the treatment of fresh settled sewage for a period of more than a year are now available, and the average results from September, 1909, to August, 1910, are presented in the accompanying table. During this period the filters were in continuous operation, except for a few hours each week while the sedimentation tank was being cleaned and from June 8 to 20 while repairs were being made on the main drain.

Sewage direct from the outfall sewer is carried to the sedimentation tank through an iron pipe 13 inches in diameter. A period of 8 hours was allowed for sedimentation during these tests.

The filters were dosed automatically by means of a Miller siphon placed within a small tank having the shape of an inverted cone, so as to sprinkle the area more nearly uniformly. The 5-foot filter was operated under a head varying from 7.5 to 2.5 feet at an average rate of 700,000 gallons per acre daily. The 7.5-foot filters were operated under a head varying from 5 feet to nothing at an average rate of 1,000,000 gallons per acre daily. The siphon tank required about 5 minutes to fill and was discharged in about 1½ minutes.

Nozzles of the Columbus-Worcester type with ¾-inch orifice were employed. Distribution was found to be very imperfect, but the results were more satisfactory than with nozzles having a larger orifice and more uniform distribution. Very little trouble was experienced in the clogging of the nozzles.

The fungus growth, observed previously, again appeared in the distribution system and on the surface of the beds during the fall and spring. This growth was readily removed from the distributing pipe by the use of a rod and flushing. It was,

likewise, necessary on a few occasions to break up the surface of the film on the beds to prevent pooling of the sewage. This was easily and quickly accomplished with a pick-axe. The growth was not luxurious or persisting enough to warrant the use of an algicide.

There was no tendency towards permanent clogging of the beds. The suspended solids appear to be greater in the effluent than in the influent. This was accounted for by the precipitation of colloidal matters and the washing out of organic growths and worms.

The suspended matters in the effluent settled out readily, leaving a more or less turbid water, but one which was free from unpleasant odors. The sludge so produced was comparatively inoffensive and is rightly termed "humus."

The average results of analysis for the year, given in the table, show very satisfactory purification in the case of both 7.5-foot filters. Filter E of the finer stone (½ to 1½ inches in size) gives considerably better nitrification than filter F of coarser stone (¾ to 2½ inches in size). At times, however, the filter of finer stone has shown a greater tendency to clog at the surface, at which times the filter of coarser material was the more efficient.

Comparing the results from the 5-foot filter (D) with those from the 7.5-foot filter (F) of the same size material, it would appear that the deeper filter had an advantage more than commensurate with the depth, as indicated in last year's report. It is a fact, however, that the distribution was not so uniform over the entire area of the 5-foot filter as it was in the case of the deeper filter. Moreover, the chlorine content indicates that the effluent from the 7.5-foot filter is diluted to a certain extent with ground water. When these facts are taken into consideration it is evident that the efficiency of the two filters is approximately proportional to the depth.

The putrescibility was determined by the methylene-blue test, the samples being allowed to stand in closed bottles at room temperature. Those samples which did not retain the color for the full period of 14 days were classed as putrescible. Various experiments have shown this to be a very rigid test.

The average analysis of the sprinkler filter effluent with the suspended matters removed compares favorably with that of the effluent from intermittent sand filtration. The rate of application per acre on the sprinkler filters was more than ten times as great as that on the sand filter beds. It should be borne in mind, however, that the sand filters were dealing with a much stronger sewage.

Another fact which must not be overlooked is that the sprinkler filter process with its preliminary treatment and subsequent sedimentation will doubtless produce as much sludge as chemical precipitation. The precipitation of iron is nearly as complete as by the lime treatment.

The monthly averages of analysis of influent and effluents show a considerable variation during the year. Purification was much reduced in cold weather. It should be noted, however, that there was never a period of more than two weeks when all of the samples failed to meet the full requirements of the putrescibility tests, except in the case of the 5-foot filter during the month of September before the bed had attained its normal working condition. The putrescible samples, with few exceptions, successfully passed the tests when diluted with an equal volume of tap-water.

The number of bacteria in the sewage was very variable, ranging between a minimum of 300,000 per cubic centimeter in November to 3,540,000 in April. The removal of bacteria did not appear to bear any direct relation to the nitrification.

The percentage of saturation of dissolved oxygen was also very variable. It was highest in the winter when bacterial activity was the least, and it was lowest during the spring and fall when the fungus growth appeared on the surface of the filters.

The total organic nitrogen in a sewage effluent includes both unstable matter and comparatively stable compounds. That portion of the organic nitrogen represented by the albuminoid ammonia is the best single indication of the amount of putres-

RESULTS OF TREATMENT OF SETTLED SEWAGE BY SPRINKLER FILTERS, SEPTEMBER, 1909, TO SEPTEMBER, 1910.

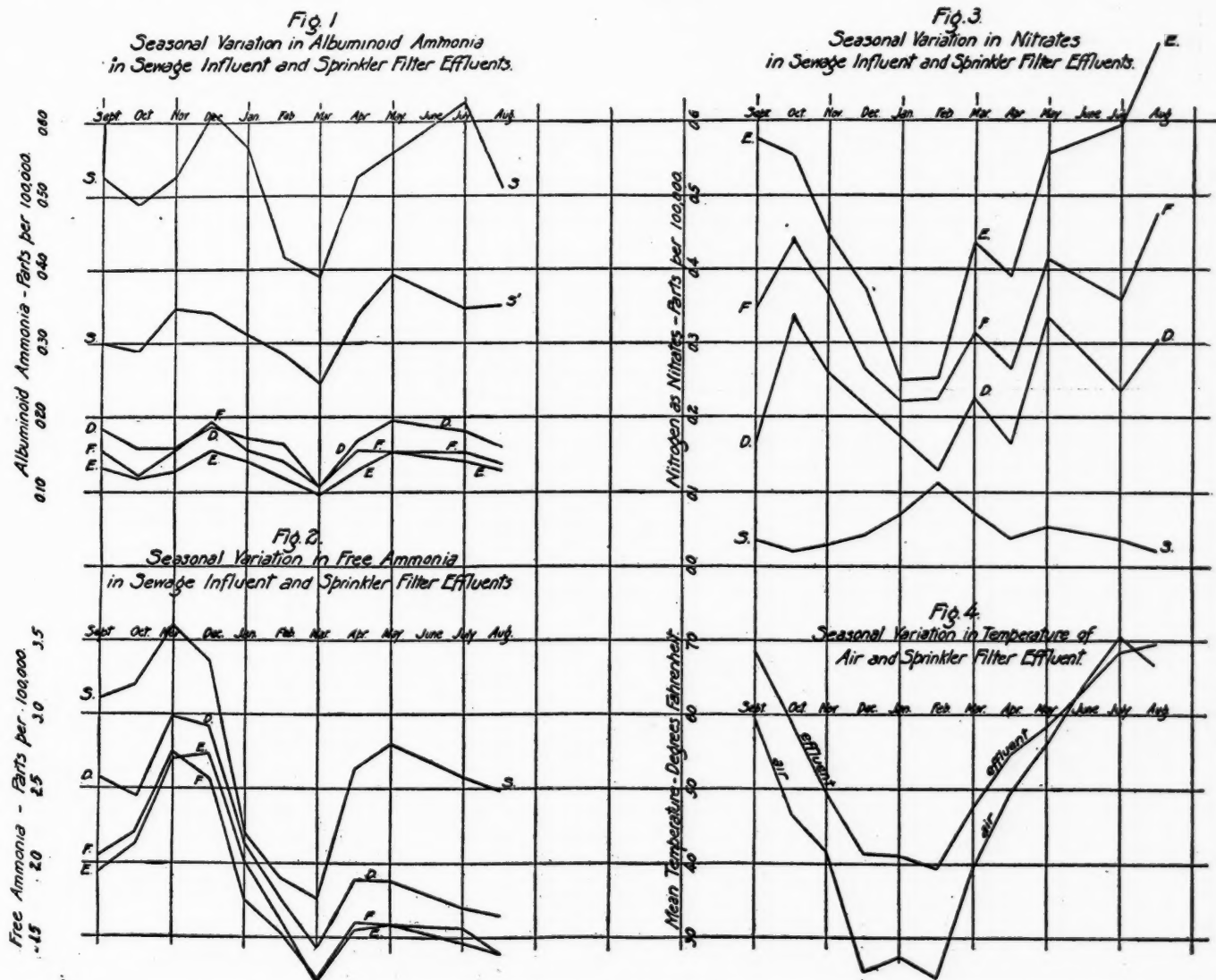
AVERAGE OF WEEKLY ANALYSES OF STERILIZED DAILY SAMPLES

DETERMINATION	ANALYSIS. PARTS PER 100,000.						TOTAL PER CENT. REMOVED					
	INFLUENT.			*EFFLUENT.			FILTER D		FILTER E.		FILTER F.	
	Total.	Dis-solved.	Sus-pended	Filter D.	Filter E.	Filter F.	Total.	Dis-solved.	Total.	Dis-solved.	Total.	Dis-solved.
Free ammonia.....	2.70	.....	.....	2.13	1.85	1.83	21.1	.....	31.5	.....	32.2	.....
Albuminoid ammonia.....	0.521	0.322	0.199	0.165	0.131	0.134	68.3	48.7	74.9	59.3	71.6	54.0
Residual organic nitrogen.....	0.663	0.398	0.265	0.155	0.130	0.163	76.6	61.1	80.4	67.3	79.7	66.2
Oxygen consumed in 2 min. at 100° C.....	8.05	5.25	2.80	1.93	1.37	1.50	76.0	63.2	83.0	73.9	81.4	71.4
Chlorine.....	11.80	.....	.....	11.48	11.37	10.62	.....	.....	.....	.....	.....	.....
Residue on evaporation.....	65.6	56.0	9.6	48.7	47.4	45.9	25.8	13.0	27.7	16.1	30.0	18.0
Loss on ignition.....	28.6	22.9	5.7	19.0	16.0	16.3	33.6	17.0	44.0	30.1	43.0	28.8
Fixed residue.....	37.0	33.1	3.9	29.7	31.4	29.6	19.7	10.3	25.5	8.5	20.0	10.6
Iron.....	3.96	2.08	1.88	0.57	0.48	0.51	85.6	72.6	88.0	77.0	87.1	75.5
Sulphur.....	4.51	4.45	0.06	4.30	4.32	4.05	4.66	3.37	4.21	2.92	10.20	8.99
Nitrogen in form of nitrates.....	0.048	.....	.....	0.226	0.468	0.336	.....	.....	.....	.....	.....	.....
Nitrogen in form of nitrites.....	0.0072	.....	.....	0.0626	0.0539	0.0548	.....	.....	.....	.....	.....	.....
Dissolved oxygen.....	.....	.....	.....	0.52	0.70	0.53	.....	.....	.....	.....	.....	.....
Temperature of effluent (Degrees F).....	.....	.....	.....	52.5	54.3	55.6	.....	.....	.....	.....	.....	.....
Percentage saturation of oxygen.....	.....	.....	.....	47.9	65.7	49.9	.....	.....	.....	.....	.....	.....
Bacteria per cubic centimeter.....	1,894,000	.....	.....	537,000	192,000	261,000	71.6	.....	89.9	.....	86.2	.....
Per cent. of samples non-putrescible.....	.....	.....	.....	70.	96.	93.	.....	.....	.....	.....	.....	.....
Rate of application in million gallons per acre daily.....	.....	.....	.....	0.700	1.000	1.000	.....	.....	.....	.....	.....	.....
Depth of bed in feet.....	.....	.....	.....	5.0	7.5	7.5	.....	.....	.....	.....	.....	.....
Size of crushed stone in inches.....	.....	.....	.....	$\frac{3}{4}$ to 2 $\frac{1}{2}$	$\frac{1}{2}$ to 1 $\frac{1}{2}$	$\frac{3}{4}$ to 2 $\frac{1}{2}$	.....	.....	.....	.....	.....	.....

*Analysis of effluent with suspended matters removed.

cible organic matter present. In the process of nitrification the albuminoid ammonia is converted into free ammonia and the latter into nitrites and finally into nitrates, considerable nitrogen being lost in the operation.

Curves have been prepared showing the seasonal variation in the albuminoid ammonia, free ammonia, nitrates and temperature of air and effluents. These curves are shown in the accompanying diagram.



D = Effluent from 5 foot filter of $\frac{3}{4}$ to 2 $\frac{1}{2}$ inch stone; E that from 7.5 foot filter of $\frac{1}{2}$ to 1 $\frac{1}{2}$ inch stone; F that from 7.5 foot filter of $\frac{3}{4}$ to 2 $\frac{1}{2}$ inch stone. S, settled sewage, unfiltered sample. S', settled sewage, filtered sample.

In summer the temperature of the effluent may be as high or higher than the mean temperature of the air. As the cold season advances the difference widens. The monthly mean temperature of the air reached a minimum of 24.5 degrees Fahrenheit, while the temperature did not fall below 39.6 degrees. The chief factors in producing the low temperature of the effluent are the spraying process and the presence of ice or snow on the surface of the filters.

The albuminoid ammonia curves (Fig. 1) show a wide variation. The greatest variation is shown in the curve (S) for the settled sewage applied. The amount of dissolved albuminoid ammonia (S') also shows a marked seasonal variation. The actual purification of dissolved organic matter is shown by the difference between the values given in curve (S') and the values of the corresponding effluents D, E and F.

The removal of albuminoid ammonia is uniformly highest in the case of the 7.5-foot filter (E) of the finer stone, except in May, when it was practically the same as that of filter (F) of coarser stone. The 5-foot filter (D) shows the least purification except in December and March, when the results were practically identical with those of the 7.5-foot filter (F) of the same material, working at a rate nearly proportional to the increased depth.

The seasonal variation in free ammonia is shown in Fig. 2, the maximum amounts in November being about twice the minimum values in February. The 5-foot filter (D) shows the smallest removal throughout the year. Filter E of the finer stone shows a removal during the summer greater than that of filter F of coarser material, while during the winter conditions are reversed.



SPRINKLING FILTER IN WINTER

The amount of nitrogen as nitrates in the sewage influent (Fig. 3) is shown to be highest in winter and lowest in summer. This is perhaps due to the increased activity of the anaerobic bacteria in the sewage during warm weather. The amount of nitrates in the effluents is lowest during the winter and highest during the summer, which fact may be explained by the increased activity of the aerobic bacteria in the filters during the warm season.

Conditions, other than temperature, may affect nitrification, as shown in the curves D and F. One of these conditions is the growth of sewage fungus on the surface of the filter tending to clog the bed and exclude the air.

Filter E of the finer stone shows much the highest nitrification, but the other 7.5-foot filter (F) of coarser stone shows considerably better nitrification than the 5-foot filter of the same material, especially during the winter. While the rate of application on the 5-foot filter was approximately the same as the 7.5-foot filters per cubic yard of filtering material, the conditions of distribution and admission of ground water, previously alluded to, indicate that the advantage in the deeper filter is not so great as might be inferred from the curves.

Nevertheless, under the conditions at Worcester there appears to be a decided advantage in the deeper filter in producing satis-

factory purification and overcoming to some extent inequalities of distribution and seasonal variations in bacterial activity. The use of the filter of finer stone which gives the highest degree of purification would be attended by the very grave danger of periodical clogging of the filtering medium.

REINFORCED CONCRETE RESERVOIRS

Giving Concrete Itself Sufficient Strength to Withstand Internal Pressure—Reinforcing Bottom of Shell—Experiences with Concrete Standpipe

IN a paper entitled "A New Theory for The Design of Reinforced Concrete Reservoirs," Hiram B. Andrews, engineer for Simpson Brothers Corporation, presented to the Boston Society of Engineers an idea which has already been employed by him in the designing of one or more concrete reservoirs of recent construction.

The fundamental idea upon which his theory is based is not a new one. It was suggested by us several years ago in a series of articles describing concrete standpipes, although we did not claim originality for it. It is that if steel reinforcement is relied upon for taking the tension caused by the pressure of the contained water, and this tension becomes any very considerable percentage of the elastic limit of the steel, then the steel reinforcing bars will slightly elongate. This means that the concrete shell must increase in circumferential length, and therefore either a large number of minute vertical cracks or a few wider ones will necessarily be formed in the concrete. These cracks are almost certain to produce more or less leakage. If the steel could be kept under its working stress while the concrete was being placed and setting, or if the cracks in the concrete could be filled with cement mortar while the standpipe was filled with water, this difficulty would be met. But plastering the inside of the standpipe while it is empty can have no beneficial results so far as these cracks are concerned. The use of a more or less elastic waterproof coating on the inside, especially if there are a large number of minute cracks rather than a small number of wider ones, would probably produce the desired water tightness. Except the last named, these remedies appear almost impossible of application, however.

Mr. Andrews theory or idea is to prevent the expansion of the reservoir when filled with water by making the concrete sufficiently strong to resist the tensile stress without cracking. In other words, he would make the concrete theoretically capable to withstand the pressure of the contained water without any reinforcement, adding the steel reinforcement as a safeguard against actual destruction of the reservoir and the accompanying serious results should the concrete fail to hold at any point. He also had found that the weakest point in the standpipe was apparently the junction of the vertical shell with the base and the first few feet of the sides themselves above the base. He therefore proposed to use here extra strong reinforcement consisting of bars well imbedded in the base and extending vertically for some distance into the cylindrical shell of the tank.

Shortly after reaching this conclusion the author prepared a design for a reservoir at Rockland, Mass.; where, said he, "we decided to use an especially rich mixture of concrete, a thickness of wall which would insure that the ultimate tensile strength of the concrete would not be reached when the reservoir was filled, to use an increased amount of vertical reinforcement especially between the base and the walls, and to install a steel dam at each horizontal joint between each day's work to prevent any direct seepage of water through the joint, provided it entered it. The hydrated lime was omitted, as we considered the proposed density of the concrete did not require it for impermeability, and also that where it had been used previously it had caused an unsightly efflorescence on the wall wherever there had been seepage. The plastering was omitted as we considered that any rigid coating upon this

mixture of concrete was unnecessary; but instead, we applied three coats of soap and alum solution, commonly known as Sylvester Compound, to fill pinholes due to air bubbles, etc. The writer does not know that this was of any practical use, but it was a precaution which we took."

In working out the details the designer assumed that 1:12 concrete was good for 400 pounds tension per square inch. The steel was assumed to receive 16,000 pounds per square inch. It was also assumed that the ratio between the moduli of elasticity of steel and concrete is 10, so that if the concrete should be stressed to 300 pounds per square inch, for instance, the steel would be stressed to 3,000 pounds. In the standpipe in question, 46 feet in diameter and 104 feet high, this required a thickness of wall of 36 inches at the base, and 9.35 square inches of steel per foot of height.

In the discussion of the paper doubt was expressed by several as to whether concrete could be relied upon for 400 pounds per whether there might not be one or more weak places where the square inch tension; and there seemed especially to be doubt whether there might not be one or more weak places where the strength might be considerably less than this, which weak places would be the location of rupture when the reservoir was filled.

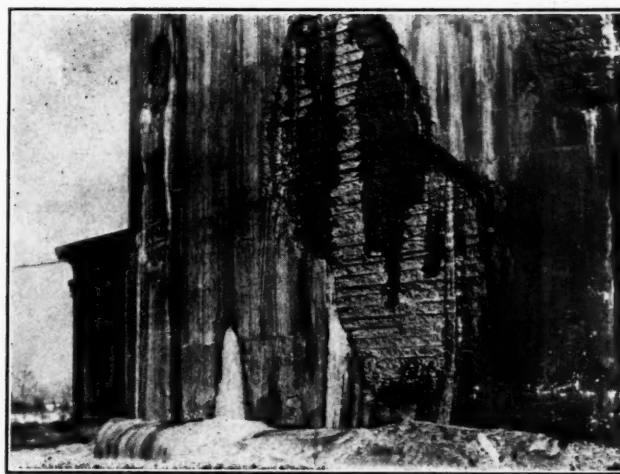
Perhaps as interesting as the paper itself was the information brought out in the discussion concerning experience with a number of standpipes which have been built for several years. The Manchester, Mass., standpipe, 50 feet in diameter and 72 feet high, leaked between the first and third joints at a maximum of 15,000 gallons in 24 hours, this being the most serious leak, according to Raymond C. Allen, who stated: "That was the most serious leak we had. The leaks at other times have been matters of perhaps a few hundred gallons a day. At the present time not more than 10 to 15 gallons a day is seeping out in a space 8 feet long and 6 inches wide at the very base." This standpipe has leaked only on the easterly and southeasterly side, where the maximum effect of the sun is felt.

Discussing the standpipes built at Westerly, R. I., and Attleboro, Mass., by his firm, L. C. Wason stated that he believed that the addition of considerable vertical reinforcement in the lower 8 or 10 feet of the standpipe wall, the ends of which are turned out and bonded well into the floor, would assist very materially and perhaps entirely obviate the formation of a horizontal crack in the lower few feet of a standpipe. "It is obvious that under water pressure the walls, owing to the deformation of the steel, must increase in circumference and the entire tank increase in diameter in proportion. At the bottom of the standpipe, however, owing to the rigid connection of the wall with the floor, this increase in diameter cannot take place. This rigidity extends a short distance upward to the point where compression on floor changes to tension in wall. At the finish of a day's work near bottom of tank at or quite close to the plane of weakness, there may be a direct movement outward of the wall above, relatively to that below, the joint when under pressure. When the pressure is relieved the elasticity of the hoops would tend to draw the wall back to its original position. That this movement is present is further indicated by the fact that when a standpipe has been kept full of water for some time, the leakage through these joints almost entirely disappears, but on emptying the standpipe and refilling it the little dams formed have apparently been broken down, as the leakage again occurs as vigorously as at first."

The Attleboro standpipe was described by F. A. Barbour. Its construction was described in MUNICIPAL JOURNAL, issue of Dec. 5, 1906. This standpipe has leaked more or less, most of the leakage having developed near a horizontal crack in the critical section a short distance above the foundation. "Some months ago a successful attempt was made to stop the several leaks, then apparent, by grouting, and the method used may be of interest. On the assumption that the repairs should be made when the wall was stretched to the maximum limit, the work was done with the tank full. At the location of each leak a hole, larger on the inside, was cut into the wall, ex-

posing the steel. This hole was filled with small crushed stone, held in place by a piece of wire netting, and the whole plastered over with mortar, a short length of 3/4-inch pipe passing through this plaster. Neat grout was mixed and poured into an 18-inch length of 6-inch wrought iron pipe with flanged top and bottom. From the bottom a lead pipe connected with the pipe in the wall, and to the top a large carbonic acid tank under 3,000 pounds pressure was connected. By a valve any pressure could be brought to bear on the grout, shooting it into the hole in the wall back of the hardened plaster facing. As much as 1/2-cubic foot of grout was forced into the wall at one point, and through it for a distance of several feet where it again made its appearance at the surface. Obviously, the conditions found suggested that the leakage was here due more largely to imperfect placing of the concrete around the steel, which was too close together, than to the horizontal crack resulting from the deformation of the wall."

Mr. Barbour stated that there had from time to time been a few small leaks in the Attleboro tank, but that at no time has more than one per cent of the entire surface been even damp. As in the case of other tanks, this tends to become absolutely water tight when kept full or at a nearly constant level; but if the tank be emptied and refilled the leakage is always greater than before emptying—presumably the lime carbonate which had plugged the openings being crushed by the contraction of the steel as the pressure is removed.



ATTLEBORO STANDPIPE DURING THE SECOND WINTER

What was stated to be perhaps the only standpipe yet built of concrete which has never leaked is one 30 feet in diameter and 78 feet high built on the State farm at Bridgewater, Mass., by inexperienced prison labor. At the end of 1 1/2 years' service it was still without a leak and had been absolutely tight since being first filled. The walls were dove-tailed into the floor and a small fillet of concrete was placed between the floor and the walls and worked in with a great deal of care. The materials were of good quality, carefully graded and mixed over thoroughly by hand. Especial pains were taken to stiffen and reinforce the joints between floor and vertical walls with steel reinforcement. The concrete was mixed 1:1 1/2:3, with 5 per cent of lime added. The sand was bank sand, clean and coarse, and the stone was crushed from field stone picked up around the farm, screened through a 1 1/4-inch screen and with all dust and fine material removed. Vertical rods were used in different lengths, one set being carried up 5 feet above the base, another 10, a third set 15 and one set was carried entirely to the top.

Attention was called by A. B. MacMillan to the importance of the amount of water used in mixing the concrete. He referred to a paper read before the National Association of Cement Users giving data which seemed to show "that the percentage of water added to concrete in mixing has a very marked effect upon its permeability and that even very slight

variations from the proper consistency give very much greater variations in permeability; that is, if too much water is added the resulting concrete is much less waterproof than one with the ideal amount of water. This ideal amount varies for different mixtures of cement and aggregate, and the nearest approximation that can be made offhand is that enough water shall be added to make a mixture which under tamping shall show water at the surface and give what we call a dry quaking mix, that is, a mix that will not quake until it has been thoroughly tamped.

The Waltham reservoir was referred to by Bertram Brewer, especially the matter of leakage. He stated that when studying the subject of concrete reservoirs preliminary to building the Waltham one, he concluded that a concrete reservoir could be built at reasonable cost, but was not by any means sure that it would be water tight. He conferred with a firm of contractors and they finally concluded that if it was not absolutely water tight it would not necessarily endanger the structure as a whole, but that it might remain sound and at the same time show considerable seepage. He frankly informed the city government that, while a concrete reservoir ought not to cost as much as a steel one and would be desirable for other reasons, probably lasting several times as long as a steel reservoir; still, it would probably leak and the local papers might occasionally alarm the people with tales of its rapid deterioration; but they should not be alarmed by this. It was with this idea of probable leaking that the Waltham reservoir was built, costing about ten per cent less than a steel one. At first there was considerable seepage and the lime began to appear on the surface so that stalactite formation became very noticeable. After a few months' use the moisture was very much reduced so that there was practically very little seepage; and while there is now considerable seepage when the reservoir is being filled, it would be practically impossible to collect any amount of water from the outside walls if it were kept full all the time. In this reservoir also it was noticed that the greatest seepage has been where the sun shines brightest; there being almost none on the north wall.

STREET CURBS

A STUDENT in Iowa State College, N. B. Garver, in preparing a thesis on the subject of street curbs has collected some information on the subject from a considerable number of Iowa cities. In discussing the general subject he stated that curbs are generally composed of concrete, cut stone, or wood, and in some cases of burned clay and cast iron. The last has been

used in a limited extent in Europe, and burned clay experimentally in this country. He refers to the fact that in the construction of combined curb and gutter, the intersection of the face of the curb with the gutter is or may be rounded, an advantage of which is that it throws the wheels away from the face of the curb and thus prevents wear by the wheels grinding against it.

The data which he gives concerning a number of Iowa cities we have tabulated, the table being presented herewith.

ROAD BUILDING IN TURKEY

CURIOUS economic conditions in regard to road building exist in Turkey, according to Consul-General G. Bie Ravndal. Some 6,214 miles of roads are under construction at a cost of over \$8,000,000. Of this mileage two-thirds are old roads to be repaired. The work was let to two companies, a German company having 90 per cent of it and a French company the balance. Labor is so cheap that machinery made by more highly paid labor, in the judgment of the contractors would effect little saving.

The most elementary tools are used, that is, shovels, picks, and hammers. Labor being so cheap, there is no necessity of introducing complicated machinery. However, the French company is about to introduce several steam rollers on their roads. The work consists of macadamizing with crushed stone and then laying a top covering of sand. No special device is used. The stone is quarried with picks and powder and broken by hand, although machinery is being imported (from England and Germany) to crush stones. The stone is carried in baskets attached to the sides of donkeys or horses; carts are sometimes used. For each cubic meter the cost of hauling is 13 cents per kilometer (0.62 of a mile). Common labor costs 26 to 30 cents per day, but generally the contractors arrange with the laborers for the crushed stone to be delivered along the roadside. The roadbed is prepared for a width of about 20 feet, then rolled, upon which is placed the crushed stone at a thickness varying from 6 to 8 inches and 12 feet wide. A layer of sand of about 3 inches thickness is then placed thereon. The maximum grade allowed by contract is 5 per cent, but the companies very frequently carry the grade up to 7 per cent. An open ditch along each side of the roadbed is constructed. Stone is used for under and cross drains. Stone and concrete are always used for culverts and bridges up to 6 meters; above that iron is used for bridges. No materials are being applied to the surface of the existing roadways in order to maintain them.

CURB AND GUTTER CONSTRUCTION IN IOWA CITIES

Name of City.	Foundation.	Forms.	Material Base.	Surface.	Finish.	Expansion.	Price per Foot.	Type of Curb.
Albia.....	4" of sand	2" dressed plank	1:3:5 concrete; 1 1/4" stone	1:1 mortar	Carlson's patent and brush	Cut into 5-ft. blocks, 1/4" sand filled joint every 50 feet.	\$0.62	Combined curb and gutter.
Centerville....	4" of cinders	2" dressed plank	1:3:5 concrete; 1 1/4" stone	1:1 mortar	Wood float trowel and brush	1/4" pitch filled joint every 50 ft.	....	Combined curb and gutter
Clarinda.....	No standard	2" plank	1:2:4 concrete; 1" stone	1:1 1/2 mortar	Trowel	Cut into 6-foot blocks	.375	Straight curb
Clinton.....	12" of cinders	Lumber or steel	1:3 gravel concrete	....	Trowel	1/4" joint at 6 ft. intervals	.55 to .60	Straight curb
Creston.....	Dirt, compact	....	1:3 sand, 25% of gravel over 1/4"	....	Trowel	Several layers of tarred paper at 20-ft. intervals	....	Straight curb
Dubuque.....	6" of cinders or crushed stone	Plank	1:3:5 concrete, stone 1/4" to 1 1/4"	....	Trowel and brush	1/4" joint at 150 ft. intervals	.62 to .85	Combined curb and gutter
Mason City....	....	....	1:2 gravel concrete	....	....	....	....	Straight curb
Muscataine....	No standard	Plank	1:3:5 concrete	2:3 mortar	Trowel	1/4" between 5 ft. sections and 1/4" joint at 30 ft. intervals	.575 to .60	Combined curb and gutter
Mt. Pleasant...	6" of sand or fine gravel	Plank	1:2:4 concrete, stone 1"	1:1 mortar	Carlson's patent and trowel	3 joints in a city block	.655	Combined curb and gutter
Oskaloosa.....	6" of cinders	Plank	1:3 gravel concrete	1:1 1/2 mortar	Carlson's patent	Cut through at 5-foot intervals	.63	Combined curb and gutter
Red Oak.....	3" of cinders	Plank	1:2:5 concrete; stone 1 1/4" crusher run	1:2 mortar	....	Tarred paper joint at 20-foot intervals	....	Combined curb and gutter; also straight curb
Sioux City.....	Dirt	Plank	1:3:5 concrete, stone 1 1/2" crusher run	1:2 mortar	Wooden float	Joint at 100 to 150-foot intervals	.75 to .80	Combined curb and gutter
Vinton.....	Dirt	Plank	1:3 gravel concrete	....	Trowel	No provision	.36	Straight curb
Waterloo.....	No special	Plank	1:4 gravel concrete	1:1 1/4 mortar	Trowel and brush	Three 1" joints in a city block	.60	Combined curb and gutter

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and without cost.

AUGUST 30, 1911

CONTENTS

Sewage Treatment at Worcester, Mass. (Illustrated).....	257
Concrete Reservoirs (Illustrated).....	260
Street Curbs.....	262
Road Building in Turkey.....	262
Reinforced Concrete Standpipes.....	263
Bangor Waterworks Notes.....	263
Constructing Road by Pumping (Illustrated).....	264
News of the Municipalities (Illustrated).....	265
Legal News—A Summary and Notes of Recent Decisions.....	272
Municipal Appliances (Illustrated).....	273
News of the Societies.....	275
Personals.....	276
Industrial News.....	277
Patent Claims (Illustrated).....	278
The Week's Contract News.....	279

Reinforced Concrete Standpipes

FOUR or five years ago, in a series of articles, we described most of the reinforced concrete standpipes built in connection with municipal water works which had been constructed up to that time; and since then have described at greater or less length two or three additional concrete standpipes and tanks. Since about five or six years ago, when the first standpipe was built largely in the nature of an experiment, quite a number have been constructed in this country, the majority of them in New England. None of these seem to have been absolutely water tight, with one exception as mentioned in an article on another page of this issue. Apparently it is almost impracticable to construct a water-tight tank without either providing such an amount of steel reinforcement that there will be practically no elongation of the rods when the tank is filled; or else by adopting the idea explained in the paper abstracted and making the concrete itself of sufficient strength to withstand

pressure. In either case there would seem to be an uneconomical use of material. In the former the steel would need to be much greater in quantity than would be required for strength only; in the latter, there would need to be sufficient steel to withstand the strain without any assistance from the concrete, and also concrete of such quality and thickness as to resist rupture without any assistance from the steel. In other words, we would have practically the material for making two standpipes, the steel being used because of doubt of reliability of the concrete.

A third suggestion occurs to us in line with the one last mentioned, in that it involves a multiplication of material. This is that with steel calculated for strength only, and subject to slight elongation, and with concrete of sufficient strength only to bridge the spaces between the steel hoops, the standpipe could be lined with wooden staves joined at both sides and ends in the same way as continuous wood stave pipe is constructed; this wood lining serving to furnish the water-tight element of the standpipe. This would probably decay in a ring at about that elevation where the water rises and falls while the standpipe is in use, but this could be replaced by new staves at comparatively little expense. The hoops and concrete would meantime furnish sufficient strength to take the pressure of the water, and there would be only the ordinary amount of leakage should the wood staves rot through altogether in places. This same idea suggests another, that the steel reinforcement of the concrete tank, instead of being imbedded in the concrete, be only partially imbedded in the outer surface of the tank and each hoop be provided with a clinching appliance by which sufficient tension can be applied to the hoops to prevent their further elongation when the tank is filled. These hoops could be kept painted with a protective coating, or after proper clinching and testing to prove the water tightness an outside coat of concrete 2 or 3 inches thick would be applied to the entire standpipe, hooks having been left projecting from the outside at intervals of a foot or so to hold this outside coating in place. The latter would probably give a better appearance and more surely protect the steel hoops from rust.

Bangor Waterworks Notes

UP to February 6 of this year the water supplied to Bangor, Me., was filtered through twenty-four Warren filters of the gravity type, first going through two coagulation basins having a combined capacity of 1½ million gallons. On the day mentioned a new filter plant was placed in operation consisting of six gravity filters having a total sand area of 2,602.8 square feet, or about 30 per cent greater than the old plant. The new filters are designed to have a capacity of 6,000,000 gallons per day, or 1,000,000 gallons for each unit.

During 1910 the old filter plant was still in service, but the operation was carefully observed and such improvements made in methods as experience indicated to be desired. Before entering the coagulation basins, sulphate of alumina, lime and whiting were added. The basins removed 79.0 per cent of bacteria during the year, the average for the previous year having been 66.21 per cent. The average amount of sulphate of alumina was 1.43 grains per gallon of water, which was 0.14 grains less than the previous year, this being a saving of about 22½ cents per million gallons. This was made possible largely because the sulphate of alumina used during 1910 was purchased by specifications, and a much better quality obtained. The average amount of alumina in the material obtained during 1910 was 18.18 per cent, while in 1909 this was but 16.96 per cent. The iron also was less than one-half as great in 1910 as 1909. The specifications by which the sulphate of alumina was purchased required that there should be not less than 17.50 per cent of alumina; not more than 37.50 per cent of acids, 0.40 per cent of iron, 47.0 per cent of water and 0.25 per cent of insoluble matter. It was specified that if the alumina should be over 17.50 per cent the sulphates could be increased in proportion. If the alumina was below 17.5 per cent but over 17.0 a deduction of 8 cents per 100

pounds was made. If the alumina was below 17.0 per cent and above 16.5 per cent a deduction of 15 cents a 100 pounds was made. For each 0.25 per cent or fraction thereof of iron above 40 per cent a reduction of 5 per cent per 100 pounds was made.

Owing partly to the condition of the filters and in part, probably, to the difficult nature of the water to treat, sufficient aluminum hydrate passed through into the mains to cause turbidity in the tap water for several days, and cause much complaint from the consumers. As a general thing, however, the aluminum hydrate which passes the filters settles or becomes attached to the interior of the mains, remaining there until stirred up by flushing, when most of it is discharged into the sewer.

From Feb. 21 to May 4, 1910, calcium hypochlorite or "bleach" was used in connection with the operation of the plant. It was found that this material produced a very high bacterial efficiency, removed some of the color and increased the alkalinity. It was also found that the amount of sulphate of alumina required to coagulate the water and remove the color could be reduced 0.25 grain per gallon or about 36 pounds per million gallons when the hypochlorite was used, and that it was unnecessary to add lime to give the water an alkaline reaction. On the basis of these savings it was calculated that if hypochlorite were used it would be possible to reduce the cost of chemicals about 60 cents per million gallons, equal to \$876 a year. Mr. James M. Caird, the chemist and bacteriologist of the board, in his report for the year, recommends installing suitable appliances so that hypochlorite can be used throughout the entire year.

During the year experiments have been made by the builders of the filters in the location of baffles in the coagulation basins. When it has been definitely decided that the most effective number and location of these has been determined it is proposed to construct these baffles permanently of concrete. Those used in the experiments are of wood only.

One commendable feature of this contract is that it was completed and the plant put into operation 20 days before the date called for by the contract, the specifications were so complete that the contractor received no extras and the total cost came within the estimated cost of the plant.

CONSTRUCTING ROAD BY PUMPING

A NOVEL method of road construction was adopted by the road supervisor of Cape May county in 1910 in constructing what is known as the Holly Beach turnpike. Holly Beach, Wildwood and Angelsea are separated from the main land by meadows which are often covered with water at high tide. As nothing edible is raised on the beach and all provisions must be brought over from the main land it is essential that there be a convenient and reliable road between the two. Up to last year there has been a road a little over 3 miles long which was built across the meadow upon poles laid on the surface of the ground. This road as well as the meadows was frequently covered by high tides, rendering the road impassable at times.

Last year the road was rebuilt 4 feet higher than the old one or about 5 feet above the meadow. This so far this year has been sufficient to prevent its being covered by any high tide which has occurred. There was also at one place a 1 per cent grade, but the maximum grade has been reduced to 0.6 per cent. This road was made by lining each side of the roadway, about 30 feet, with sills and fences and then pumping a mixture of sand and water onto the roadway. In this way sand was deposited about 3 feet to 3 feet 6 inches deep. This was then leveled off and a gravel surface applied which varies from 9 inches in depth in the center to 3 inches on the outer edges; the roadbed being 30 feet wide. This furnishes a good, hard road for the travel which has so far made use of it.

The total length of the road was 16,064 feet, of which a gravel surface was furnished to 15,325 feet. The earth excavation amounted to 955 cubic yards and the embankment to 177,943 cubic yards. In connection with the filling 11,261 lineal feet of road had fencing and curbing applied to both sides. The gravel cost \$1.74½ cents per cubic yard, the excavation 20 cents, the sand embankment 20 cents, the curbing 4 cents per lineal foot (each side of the road) and the retaining fence 9¼ cents per lineal foot. The total cost of the 3 miles was \$56,530.57; to which is to be added \$5,477.94 for supervisor's salary, engineering expenses and certain extras.

The engineer of this work was R. Fendall Smith, and O. B. Smith was the supervisor.



HOLLY BEACH TURNPIKE DURING CONSTRUCTION. SAND FILL BY PUMPING

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Immense Asphaltum Deposit Discovered

Albuquerque, N. M.—Prospecting for oil in Valencia and McKinley counties near the Seven Lakes country, where oil wells were recently found, a party found an immense deposit of asphaltum, believed to be the only deposit of its kind in the United States. Amado Chaves, well known attorney, born near the place of the discovery, brought a sample to this city, believing it was petroleum gum. It was analyzed by reputable chemists. The deposit is said to cover many acres of land. The asphaltum is on government land and it was immediately filed on by residents of this city and Valencia county.

Steam Shovel Saves City Money

Des Moines, Ia.—Dirt is being removed by the steam shovel operated by the department of streets and public improvements for approximately one-third the cost prevailing under the old system, which depended on laborers and teams. Commissioner MacVicar, in comparing the shovel with the former method, said: "Five hundred and twenty yards of dirt have been moved at a cost for laborers, teams and engineers of 18.6 cents per yard. There were employed thirteen teams, thirteen laborers and two engineers working eight hours per day. The teams received \$4.50 per day and laborers \$2.25 per day. The grading of West Seventh street from Grand Avenue to Park street last year, under contract, cost the city 49.6 cents per yard. All classes of labor are benefited by the use of the new steam shovel, and without it I think Ninth street could not have been graded this year. With the labor saving device employment is given to hundreds of laborers and mechanics who are employed in lowering conduits, gas and water pipes, sewer, stringing electric wires, removing and relaying street railway tracks, raising buildings and constructing paving and sidewalks."

Asphalt Paving Damaged

Omaha, Neb.—People living out on Thirty-eighth street, between Leavenworth and Pacific streets, are up in arms over the prospect of losing their asphalt pavement. The intense heat and the heavy traffic over the street is causing the pavement to roll up and fears are expressed that it will move away. It so happens that a large portion of the hauling between Omaha and South Omaha passes over Thirty-eighth street. During the hot days the asphalt rolls up and is laid in high ridges against the curb.

Trying New System of Sidewalk

Salt Lake City, Utah—A new system of sidewalk construction, which does away with the smooth cement surface finishing, is being tested in the northwestern portion of Salt Lake City and if found to be as successful as expected the system will be used in all sidewalk extensions in the future. Heretofore it has always been the custom of the city to have the specifications call for a cement finishing above the concrete face of all walks, but after the matter had been considered by the city engineer and Board of Public Works it was decided to change the specifications in the contract for this extension, which embraces twenty-five miles of walk, and try the new method, which has been introduced in other cities, and used with much success. The new method consists in using the same amount of cement as in the old walks, but instead of a pure cement coat being laid on top of the concrete base all the cement and concrete is mixed together and the sidewalk is laid as one solid piece. There are a number of advantages claimed for the new walk, principal among which is that there is no danger of "flaking" or chipping, such as occurs when there is a separate coating of cement laid over the concrete.

Using Redressed Granite Blocks Laid in Cement

Albany, N. Y.—Contractor B. F. Mulderry has begun the work of improving the section of Livingston avenue from Ontario street to the Black road, as authorized by the common council. The pavement will be dressed granite block, similar to that laid on Maiden lane, a new method of paving in Albany. It is a patent pavement, known as the Hassam block. The old granite blocks are broken and laid on a concrete foundation with the new surface up and the whole is cemented together, making a smooth, but not slippery pavement.

Bidding for State Aid in Road Building

Florence, Ala.—If an example in the construction of roads in Lauderdale county is followed by other counties of Alabama, the State Highway Commission will be a very happy body, according to Maj. V. B. Atkins, member of the commission, and W. S. Keller, highway engineer. The precedent, which the county is establishing, consists of allowing the state aid of \$2,000 to go to the road which bids the most for it, the burden thus being lifted from the shoulders of the various boards of revenue, which are finding the selection, not only difficult, but calculated to engender prejudice. According to the highway officials, the commissioners of Lauderdale county chanced upon the novel idea of offering bids as a means of ridding themselves of a very difficult problem of deciding which road should first receive the state aid. All sections wanted it, and all insisted upon getting it. The outcome was, the county advertised that those who would bid the most money for the road should receive the attention. The results have not yet been submitted to the State Commission, but are being eagerly waited.

Road Train for Highway Department Received

Denver, Colo.—The Buffalo-Pitts road train, with the big traction engine recently purchased by the State Highway Commission for use on county roads throughout the state, arrived in Denver and will be placed on the Evergreen road. It cost \$7,300. The engine weighs twenty-five tons. With the cars, it will give Colorado one of the most complete road building outfits in the country. The engine will make a speed of five miles an hour, hauling the train of six cars, each having a capacity of ten tons of gravel or dirt.

Experts to Investigate Paving

Cleveland, O.—Cleveland's fine brick pavements and the splendid stretches of pavements of the same material to be found in every nook and corner of Cuyahoga county are to come in for formal investigation by the United States government. Will P. Blair, Engineers building, secretary of the National Paving Brick Manufacturers' Association, who moved the headquarters of the organization from Indianapolis to Cleveland a short time ago, has received word that J. E. However, a government expert in testing materials, with several assistants, will arrive in Cleveland this week to make exhaustive tests of paving materials, particularly paving brick. The whole question of the behavior of brick as a paving material will be carefully investigated and reported upon to the bureau of standards of the department of commerce and labor, under the auspices of which the tests are to be made here.

Likes Combination Wood and Granite Pavement

Cincinnati, O.—Service Director Sundmaker and City Engineer Shipley are compiling data on the Eastern avenue paving contract which has been subjected to criticism by the Bureau of Municipal Research, and Sundmaker will soon have his formal reply ready; he declares that the cost of the combination will not be greater than granite, but will be some \$7,000 less. He said that the combination of wood block and granite makes a better pavement for all classes of traffic than either material alone.

SEWERAGE AND SANITATION

Plan to Meet Sewer Difficulty

Oakland, O.—Another solution of the sewer problem confronting some of the districts in the annexed territory following the invalidating of the sewer bonds by the recent opinion rendered by the Supreme Court is to proceed under city ordinances governing sanitary regulations in the city of Oakland. According to those interested it is stated that the city can, under an ordinance regulating the maintaining of cesspools by private individuals, force them to meet certain sanitary requirements, and should these property owners fail to do so, the city can then proceed in the matter by laying sewers and charging the cost of the work against the various owners. This, according to the statement made, will provide for the lateral sewer lines, but does not cover the main line through the center of the street. The method of procedure suggested is for the city to declare all cesspools unsanitary, the property owners to fail to comply with the regulations and the city proceed to lay the sewers. Means for accomplishing the installation of the main system is now being looked up by the attorneys in the case.

To Oil Breeding Places of Mosquitoes

Louisville, Ky.—An order has been issued by the Health Department to the Street Cleaning Department to oil the ponds of the city and destroy the breeding places of the pestiferous mosquito. There are not as many ponds to oil this year because of the lack of rain in these parts, and the water in the few remaining ponds is very low. Each year, in the month of August, upon the order of the Health Department, the Street Cleaning Department oils all the ponds in the city to prevent the hatching of mosquitoes. "I do not believe there are as many mosquitoes this year as there were last year," said Dr. W. Ed. Grant, Health Officer. "I attribute this mostly to the vigorous campaign carried on against the mosquito last year. We will take the matter of oiling the ponds up at once, as we believe this work is conducive to the public health."

Proposition Regarding Electric Treatment of Sewage

Los Angeles, Cal.—A novel proposition under which the city, seemingly, will take no risk and which may result in the solution of the purification of sewage problem, has been submitted to the council through Mayor Thum, by Engineer Harris, of Los Angeles. Harris, who is the inventor of an electro-magnetic system of purification, agrees to give a bond for a suitable amount under which, if the city will install a single unit of his system, at the city farm, and it does not work, the city will receive back the money expended. If the city does build the unit and it should prove satisfactory, the city is then to pay the inventor \$7,500 for the right to use the patent forever. The whole matter will be carefully investigated and the experiment may be tried, as the councilmen state that they feel that if such a system can be made to work it would be worth to the city many times the cost.

Intercepting Sewer Blamed for Water Contamination

Cleveland, O.—Claim that contamination of water off the east bathing beaches arises from the mouth of the city's big intercepting sewer was characterized by Assistant City Engineer Estep, who has long been in charge of intercepting sewer construction, as "all bosh." Estep and Assistant City Engineer Thomas inspected the mouth of the intercepting sewer 2,600 feet from shore and both declare that there was evidence of contamination only within a circumference of seventy-five feet. The rest of the water was not discolored, they say. Supt. Ford, of the Health Department, said: "If the contamination does not arise from the intercepting sewer where does it come from? It is evident that there is contamination and something should be done." Assistant City Engineer Estep believes that the city should filter its drinking water and that water filtration should come in advance of sewage disposal. A carload of chlorine has been ordered and the work of installing a chlorine mixing plant at the Kirtland pumping station will soon be started. The chlorine will be mixed with the city's drinking water supply as soon as the plant is in working order. The city will pay \$375 per car load for the chlorine.

No More Public Cups

New York, N. Y.—The Sanitary Code ordinance, which comes into force in New York City on Oct. 1, abolishes drinking cups in public places and the hotels, public schools, railroad stations, and theatres. Assistant Manager Stewart, of the Waldorf-Astoria, said that girls attired in white will be stationed near the four drinking fountains in the foyer to serve water in individual glasses to thirsty guests free of charge. James B. Regan, proprietor of the Hotel Knickerbocker, said the fountains would be discontinued, and water will be served free in the restaurant and bar. The managements of the Plaza, St. Regis, Gotham, Ritz-Carlton, Belmont, Manhattan, Astor, Rector's, Savoy, Netherlands, Martinique, Holland House, and other prominent hotels have adopted the same plan. Individual drinking cups are to be obtained at the Pennsylvania Station by dropping a penny in the slot, and the same system will be carried out at the Grand Central Station. Children will have to provide their own drinking cups at school. The theatres will discontinue the fountains, but retain the boys who serve water in the auditorium between the acts. It is expected that the new sanitary law will be felt most in schools and factories, as it will be a violation of the law for any person to loan his or her drinking cup to another.

Plans for Passaic Sewer Revised

Passaic, N. J.—Assuming that five of the twenty municipalities that are directly interested in the proposed Passaic Valley sewer will not enter into the project, the commissioners in charge of the work have had their engineers prepare revised plans and estimates of cost, which will be submitted to the contracting communities. It is understood that these municipalities will ratify the new plan, which eliminates Montclair, Orange, East Orange, Bloomfield and Glen Ridge from the project, and that as soon as this has been done the work of digging will be commenced. Under the altered plans, with the five dissenting municipalities eliminated, the size of the proposed sewer will be reduced and the total cost of the work will be cut down from \$12,250,000 to \$11,250,000. Through leaving out the five objecting communities, however, there will be a loss in the ratables of something more than \$2,000,000. This will leave a net difference of a little more than \$1,000,000 and if the new plan is ratified by the remaining fifteen municipalities this sum, in excess of the original apportionment of cost, will have to be borne by these municipalities. Under the old plan Newark's share of the cost would have been \$6,416,169. The new estimate, it is understood, fixes the cost to this city at a little more than \$7,000,000. Paterson's cost, according to the revised plan, is increased about \$200,000. The smallest difference is in the cost to North Arlington. That borough, under the revised estimate, will have to spend about \$300 more than the cost originally apportioned to it. The general increase in the cost to each of the fifteen municipalities is about eleven per cent.

Asks Municipal Milk Congress

Chicago, Ill.—Health Commissioner George B. Young hopes to cause enough interest in the subject of milk to bring about the holding of a municipal milk problems congress during the course of the national dairy show to be held in Chicago late in the fall. In his opinion the milk question should be taken up at the same time when the dairymen are present in the city in large numbers. "By so doing," he said, "we will be able to reach personally many who will become interested in the work and prove valuable assets. Not only will the various agents of better government in the city be present at the convention in large numbers, but those from smaller communities around Chicago will also attend."

Roller Towel Abolished

Chicago, Ill.—The common roller towel, as well as the public drinking cup, has recently been tabooed in Chicago by a city ordinance passed by the City Department of Health. The drinking cup ordinance became effective on Aug. 8 and the roller towel ordinance on Aug. 10. Each ordinance is published in full in the weekly Bulletin of the Chicago Department of Health for Aug. 5, 1911. A state law against the public drinking cup went into effect on July 1, 1911.

Mayor Finds River Conditions Bad.

Indianapolis, Ind.—As a result of his investigation of sewage in the water of White river near Indianapolis, Mayor Shank says he has found a more serious problem for the city of Indianapolis to solve than the question of garbage disposal. The mayor says the disposal of the city sewage is such an important question that he believes a bond issue will be necessary to take care of it. He will ask City Engineer Klausmann to make a report to him concerning methods and cost of disposing of sewage so that it will not contaminate the river. "I had no idea that the river water was in such bad condition until I took some samples of it," said the mayor. "It is terribly filthy. We will have to do something to better conditions. There is no getting out of it." The mayor said that he and Dr. C. S. Woods, city sanitarian, took samples of White river water, northeast of Indianapolis, where the water was in comparatively good condition; at Riverside park, where the condition was much worse, and about seven miles down the river, south of Indianapolis, where the water was filthy beyond belief. These samples were brought to the Board of Health office, where bacteriological examinations are being made. It will take a few days to complete these examinations, and Dr. Woods will then make a report to the mayor. Mayor Shank says he will ask the city engineer to see if he can work out some plan whereby all the sewage in the city could be run to a plant for destroying or taking care of the organic matter in the sewage. "There's no use trying to make the packing plants, stockyards and other firms which empty sewage into the river quit doing so as long as the city of Indianapolis is the worst offender," said Mayor Shank.

Will Place Bars in Sewer Inlets

Bloomfield, N. J.—After considering action for some time, the Bloomfield Council has settled a plan to safeguard sewer catch basins in the town. Protection has been demanded since one child lost its life by drowning and another had a narrow escape from a like fate in a fall through the basin opening. Frederick Sadler, chairman of the Sewer Committee, stated that he had secured bids for iron bars at the entrances to the basins. The cost will be about \$2 for each bar. The council authorized the Sewer Committee to go ahead with the work.

WATER SUPPLY**Novel Power Plan Proposed**

Louisville, Ky.—Clarence W. Parsons, Consulting City Engineer, proposes a plan that he declares will perpetuate the greatness of Main street—a plan looking to the furnishing of power to industries and concerns that would locate on either side of the street. The plan is the building of a conduit along Main street, from the river on the northeast of the city, to the river on the west; insert a number of turbine water wheels in the stream thus formed for the generating of power, and by a proper arrangement of shafting, gearing, pulleys, etc., transmit this power to the various places where it is needed to produce the necessary energy. Mr. Parsons goes on to point out that this scheme is perfectly feasible and practicable (there being a sufficient difference in level of the two elevations of the river, namely, 25 feet to produce the requisite power). The plan may fail, however, because of Governmental objections. The conduit would take away so much water from the river that it might seriously interfere with the much-desired nine-foot stage which the Government has been working for so long to insure continuous navigation of the Ohio River from Cairo to Pittsburgh.

Water Is Not Polluted

Cincinnati, O.—The first series of samples of Ohio river water taken by the Chemistry Department of the city water works since the raising of the Fernbank dam failed to show any increased pollution of the water as a result of the raising of the dam. As some of the wickets have been down, the conclusion is not final, and other samples will be taken after the upper pool has been filled for several days in succession.

Water Analysis Shows Bacteria High

Williamantic, Conn.—The return made to the city clerk by the state chemist, James H. Newlands, of Middletown, shows that the city water supply is not in the best condition. It has been the custom of City Health Officer Dr. W. P. S. Keating for some time to have Henderson S. Moulton, superintendent of the Water Department, once a month draw a sample of the city water from some tap in the city and send it to the state chemist for analysis. The report from the chemist regarding the last analysis of the Williamantic drinking supply states: "The mineral contents of the water is low, the water is soft, the figures for organic constituents are not high, and the chlorine is about normal." The report further states that the number of bacteria is quite high and bacteria of the colon type were found. It is on account of the colon bacteria that both the state chemist and the local health officer regard the condition of the water supply as rather doubtful, and both agree that no water should be used for drinking purposes until it has been boiled. County Health Officer George E. Hinman, with the assistance of Health Officer Keating, is to carefully examine the watershed.

Proposition to Supply City With Water Indefinitely

Sacramento, Cal.—Francis V. Keesling, president of the Sacramento-Folsom Railway, claims that he will shortly be ready to submit to Sacramento a proposition by which the city may purchase from a company he represents, sufficient mountain water to supply the city for all time. This intention he announced some time ago, but since that time has devoted his energies to getting the project into shape for presentation to the City Trustees. The water to be sold by Keesling was purchased by him from the Natomas Consolidated.

Water Famine in Several Villages

Ardley, N. Y.—The Hudson River villages, including North Tarrytown, Dobbs Ferry, Ardsley, Hastings, and Scarsdale, are facing an acute danger of a shortage in their water supply. These villages are supplied by the Consolidated Water Company, which takes its supply from the water shed centering at Pocantico, and the company stores its water at that place. At present the reserve supply is very low and it is feared that another month without rain will reduce the reserve to such an extent that the water will begin to foul. There is in circulation a petition asking Supervisor Charles Millard of Greenburg to call a special election to let the property owners pass upon a proposition to bond the town and take over the water company's property and franchises and supply the villages direct. Then it is proposed to raise the dam at Pocantico and increase the capacity of the lake. This is something the water company has failed to do because, it is supposed, there is danger that the villages may, on the completion of the Catskill system, seek service from New York, which they can do, under the law, at a nominal cost for water. In that case the expense of raising the dam would be unwarranted. If the town takes over the watershed rights it will be bound to use its own water supply. Nothing can be done to increase the present supply to ward off the danger of a shortage this fall.

Allege Water Endangers Village

Glens Falls, N. Y.—Health Officer F. M. Nolan, of South Glens Falls, has received word from State Health Officer E. H. Porter that the water used in that place is contaminated. He stated that each public centimeter of water contained many thousand bacteria, and suggested that it be boiled before used. The sample of water was sent in July. Mr. Porter says that it is possible that the condition of the water has been caused by a fungus growth.

Electric Pump for Auxiliary Use

Collinsville, Ill.—On account of a threatened shortage of water, owing to the steam pumps at the pumping plant of the city water works being of too small capacity, the city has just closed a contract with the Collinsville Electric Company for one electric motor driven pump. It has a capacity of 450 gals. per minute. Under the terms of the contract, the city is to pay two cents per kilowatt for the power and an additional half cent per kilowatt, until the price of the pump is made up. The price of the pump is \$1,130.

STREET LIGHTING AND POWER

Plans Perfected for Boulevard Lights

Baltimore, Md.—Robert J. McCuen, Superintendent of Lamps and Lighting, has completed tentative plans for the lighting of the new boulevard and University parkway. The announcement that the plans for the lighting of this boulevard, which is to be Baltimore's finest thoroughfare, are complete means more than the mere mapping out of the plans for lighting, because the installation of the lights will mark a new era in the city's progress, in that gas mains, conduits, etc., will be laid under the sidewalks, and will not necessitate the tearing up of the street, as is now done over the entire city when lamps are to be connected up or gas mains attended to. It will cost, according to Mr. McCuen's tentative plans, about \$10,000 a year to light the new section of the city, which will include Charles street from Twenty-ninth street to University parkway; St. Paul street from Thirty-first street to University parkway and University parkway from St. Paul street to the city limits. The lamp decided upon will be the regular boulevard type of lamp, as used on the boulevards and wide avenues in New York and other cities, and will be ornamental, in keeping with the Parkway.

City Will Sell Electrical Equipment

Alameda, Cal.—Alameda is to be the proprietor of a store on Park street and become a full-fledged merchant. The Electricity Commission has decided to establish an electrical store on Park street, where every manner of appliance can be obtained by local residents. The purpose of the store is to encourage the more general use of electricity; the commission finding that it has plenty of current to sell in the day time.

Underground Wires an Improvement to City

York, Pa.—Within a short time the citizens of York will have the pleasure of observing their Center square freed of the wooden poles and network of overhead wires that now traverse it. The lighting wires will go underground and the present arc lamps will be replaced by 60 lamps supported on 12 ornamental iron poles, five lamps to the pole. This great improvement has been possible by the initiative and public spirited action of the Edison Electric Light Company, which months ago first suggested this proposition which is so soon to become a reality. Preparatory work has been done for weeks so that when the time comes to make the change there will be no delay in giving the Center square of York an appearance that will compare favorably with cities of many times the population of this city.

Anxious to Be Best Lighted City

Philadelphia, Pa.—The Philadelphia Electric Company expects to have the 899 new electric lights, recently authorized by Councils, in operation by September 1, according to a statement made by James F. McLaughlin, Chief of the Electrical Bureau. "With the installation of these lights," Chief McLaughlin said, "Philadelphia will be the best lighted city in the world."

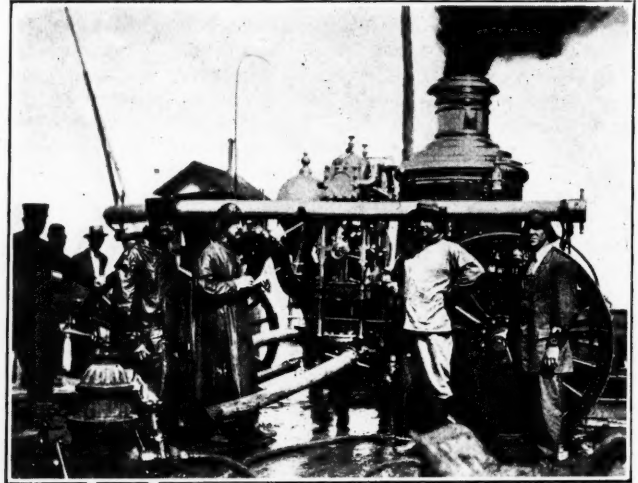
Flaming Arc Lights on Trolley Poles Adopted

Augusta, Ga.—The Street Lighting Committee of the City Council has decided upon the flaming arc lamps for Broad street. The style of lamp to be used will be the lamp which was shown in front of the Chronicle office on the night the test of the lamps was had. The lamps will be mounted on top of the trolley poles in the center of Broad street, and will be fastened to a goose neck arm, with two lamps, one on each side, and about four feet apart. There will be about three of these lamps to the block, except on the longer blocks. The poles to be used in the street will be made of steel and very ornamental, and they will replace the present unsightly cypress poles which are being used. Each lamp will afford about five and a half times as much light as the present street arcs, so it will be seen that on each pole there will be 11 times as much light as on the poles at present. It is Mr. Deal's opinion that Broad street will be the best lighted street in the country when the new arc lights are installed.

FIRE AND POLICE

Grand Rapids Fire Apparatus Tested

Grand Rapids, Mich.—Grand Rapids' fire fighting engines were tested recently by Charles R. Barker of New York, engineer in charge of the party of inspectors for the National Fire Underwriters' Association. His assistants were R. C. Dennett and H. E. Newell, also of New York. The steamers were, one by one, put through a most severe trial at the Leonard street bridge, near No. 5 engine house. They were given a 20-minutes' capacity test, during which time the big fellows, such as is shown in the illustration, threw 1,100 gallons per minute. Vacuum tests and pump valve trials were given the machines, and every piece of machinery thoroughly scrutinized. The big steamer in the



Courtesy Grand Rapids News.

ENGINE RUNNING FULL SPEED DURING TEST

picture is shown running at top speed, at 270 revolutions per minute. Inspector Barker found Grand Rapids' fire fighting equipment in ideal condition. This is the first inspection since four years ago, when the equipment scored a loss of but 5.7 per cent. Assistant Master Mechanic F. G. Hill, of the department, expects that this inspection will show up much better than four years ago, as since that time four of the engines have been re-bored and the pumps leather-packed and new ones added. The inspectors expect to spend seven weeks going over everything in connection with the fire department, the buildings in the city and, in fact, whatever is taken into consideration in fixing the fire risk rates in the city.

Firemen Must Be Familiar with Territory

Tampa, Fla.—In pursuance with orders issued by Fire Chief Mathews, the men stationed at the different fire stations will soon begin to make a systematic and house-to-house inspection with a view to acquiring all the possible information that may be needed for the successful coping with any fires that may break out in any part of the city. This action of Chief Mathews is resultant of an examination he recently subjected his men to in which it was shown that many of the men are "rusty" on some of the essential things which they should be acquainted with. Accordingly General Order No. 66 was issued instructing the Captains and Lieutenants to see to it that their men have a perfect understanding and knowledge of the conditions existing in their respective territories. Every man will be expected to know the location of all the hydrants, standpipes, fire escapes, scuttle holes, etc., in the territory covered by the apparatus from his station. To acquire this information in such a way as to make it effective in time of fire, the men will make a house-to-house inspection, following which they will again be examined by Chief Mathews. That a thorough knowledge of conditions is necessary may be readily seen. The firemen from time to time are transferred from one station to another and in the space of a short time every man in the department will be thoroughly conversant with all the details in the city.

Think Two Auto Patrols Necessary

Bridgeport, Conn.—The worth of the auto patrol to the police department and the need of an additional machine, something long felt by those intimately acquainted with police department procedure, was officially recognized by the board of police commissioners at a meeting recently held. It was shown that the temporary loss of the one now owned, but in the paint shop, is keenly felt and its value shown by contrast. The opinion is that there should be a second patrol wagon to help the other in the rush of business and also to do service while the other is out of commission, which may be three weeks longer. How the absence of the machine prevents quick work in emergency and partially cripples the police service was shown. The commissioners showed by their talk that they consider that the days of the horse-drawn patrol have passed and although good enough once that the auto patrol has shown them the difference and the idea is emphasized that the police department should not suffer through lack of apparatus.

Want Big Appropriation to Increase Service

Boston, Mass.—Two interesting communications concerning the fire department problems of Boston have been added to the documentary evidence now before the public. One is a report of the Finance Commission sent to the Mayor and the City Council and the other is a statement by Mayor Fitzgerald to the press. The Finance Commission, after what appears to be an exhaustive investigation, advocates the addition of fifty men to the department and the purchase of motor apparatus, calling for an appropriation of \$193,000 to meet the emergency. Mayor Fitzgerald doubts if more men are needed, suggests new stations with auto engines in the hazard districts, the possible redistribution of the department and announces his purpose to appoint a commission to study the department needs. The Finance Commission would have a renewal of efforts to secure legislation to amend the building laws and to extend the building limits, would repeal the ordinance which regulates the time off and meal hours of firemen, and gives its official sanction to the recommendations of Fire Commissioner Daly for the purchase of fifteen automobile runabouts for the district chiefs, three automobile combination wagons, twenty-three automobile chemical hose wagons, four automobile ladder trucks to replace twelve horses and four out-of-town ladder trucks, two automobile ladder trucks to replace four horses and two chemical engines. The fire commissioner recommends an appropriation of \$200,000, while the Commission believes that \$175,000 will be enough for new apparatus and \$18,000 for the additional firemen for the rest of the year.

Snake's Body in Fire Hose

Huntington, Ind.—Firemen fighting flames at Andrews found the body of a blacksnake eighteen inches long in the hose. The feed pipe for the engine had been placed in Loon creek and the snake had been sucked into the engine and through a line of hose nearly a quarter of a mile long. The snake's body closed the nozzle and it was impossible to get water through it.

Alarm System Serves Three Purposes

Venice, Cal.—A three-purpose alarm system, automatic in revealing its own defects, is in operation here for the police and fire departments and the life-saving crew. Officials of the Los Angeles police and fire departments agree with H. W. Ball, city electrician, that the system is a nearer approach to perfection than any yet devised. The ideas of five young men, electrical engineers of the beach and Los Angeles, are embodied in the system. The expense of installing the service, with its three arms of report, is about \$3,000. A large amount has been expended every year in repairing the present alarm system and without entire success. The new device will pay for itself in a few years, it is claimed, and will last for 25 years or longer. Twenty-two wires are carried in a cable, insuring their protection against moisture and other interference, and a total of about 76 miles of wires will connect the police station, the central fire station and the Ocean Front bath house with the alarm stations. Fifteen alarm boxes will be available

for summoning the life-saving crew to any frequented point of the beach. The annunciator at the bath house is equipped with numbered buttons that show light when the corresponding alarm box is operated. A bell rings also until the button is pushed in response. Any defect in the entire connection will start the bell jingling as it does in a street car, when the trolley is off. Telephone and red light appliances are provided for the police and a comprehensive alarm service for the fire department. All metal fixtures are galvanized to resist the corrosive action of salt air. Extra wires are laid in the cable to admit of extending the service whenever growth of population may demand it.

Power Plant for Fire Protection

Meadville, Pa.—For two very excellent reasons, to lower their insurance rate and also for the protection of their property, the Northwestern Pennsylvania Railroad Company has just installed in the power plant in this city a first-class system of protection against fire. Long coils of two-inch hose have been placed in three departments of the plant, two in the car barn, two in the engine room and one in the boiler room. Each of these five lines of hose have attached full size play pipes, and the equipment is so arranged that the water can be turned on instantly. The water lines are connected with the main pump and give a normal pressure of about 40 pounds to the square inch, but back of it is power sufficient for a pressure of 125 pounds to the square inch, which is about equal to the greatest pressure in the city water main, and with this equipment it will be possible to reach any part of the big plant in a few seconds with one or more killing streams. While the amount of saving in insurance by the installation of this fire prevention system is not stated exactly, it is learned that it will amount to several hundred dollars, more than enough to pay for the installation of the entire system the first year, in addition to affording a fine system of protection against fire almost the instant it appears, if one should happen to occur.

GOVERNMENT AND FINANCE

City Hasn't Paid Taxes

Oklahoma City, Okla.—More unknown debts of the city came to light recently when Commissioner Trueblood informed the board during its session that on a certain piece of property owned by the municipality back taxes are due from 1905 to the present. He informed Mayor Grant that he has requested the City Auditor to furnish himself a complete list of the city's realty holdings and will investigate further how much taxes the city owes.

Court House Plan Changed

Boston, Mass.—A marked change in the plans prepared for the new City Hall annex will be made at the instance of the city's Advisory Board and with the approval of the Mayor. Original plans called for an 11-story building and a tower, the building to be 125 feet high and the tower containing a clock to rise 75 feet above the top of the building. The eleventh story and also the tower will be eliminated. The change will be greatly appreciated by all the occupants of the building in that it adds at least six inches to the height of every room. Taking a summary of the departments that will be located in the new building, it was found that with eleven stories at least two would remain unoccupied by the city. It was not deemed advisable to have so much space thrown upon the market for private uses. As it is now only one floor will be vacant when the building is completed, and City Hall officials who look into the future believe that in at least five years that space will be demanded by city departments which will have outgrown old quarters. If more space is needed at that time or further into the future it will be impossible to add the eleventh story unless by a new legislative enactment revising the present law as to the height of buildings.

Commission Form of Government Defeated

Chickasha, Okla.—The commission form of government has been defeated by 67 votes in the second attempt to inaugurate the system.

Want Money to Conduct Government

Gary, Ind.—Members of the Common Council Finance Committee are considering ways to raise money to operate the government of Gary for the next nine months. There is on hand in the general fund a cash balance of \$18,000, which will be supplemented by \$75,000, the estimated November tax collections. No more money will be available until next May. It now costs \$20,000 a month to conduct the government of Gary. Cash on hand will run the city for twenty-seven days and total receipts later will last nearly five months. This will leave a deficit of nearly ninety thousand dollars.

City Records Burned

Loogootee, Ind.—Fire that was caused by spontaneous combustion or by a match that had been carried by mice to the upper story of the Goyert & Vogel poultry house here destroyed the entire building, with its contents, and the Moran building, nearby. J. V. Raney, manager for Goyert & Vogel, lost \$200 worth of personal effects. Mr. Raney was also City Clerk, and in his desk were city records and files, and these also were burned.

No Remonstrance Against Improvement Work

Tacoma, Wash.—Municipal contracts under way during August are valued at \$863,386, according to the monthly report of Commissioner of Public Works Owen Woods. This includes the bridges over 11th street. The vertical lift over the waterway involves an expenditure of \$380,457, while that over the Puyallup river will cost \$149,543. Other large contracts under way include an \$88,200 brick, plank and sandstone paving job on East 25th and 26th streets. According to the report, \$94,845.75 worth of contracts were awarded during July. During the same period completed contracts amounted to \$38,936. This brings the total value of contracts completed and accepted since January 1 to \$486,881. The report of the Street Cleaning Department shows that 410.82 miles of pavement were covered by cart men in July, while horse sweepers cleaned 184.13 miles of brick, stone and asphalt pavement. In the same period washing machines cleaned 8 miles of pavement. The report says not a single remonstrance was filed against any of the improvement work projected. The total receipts of the department amounted to \$2,157, while the money disbursed was \$33,217. The various disbursements were made in the following departments: Commissioner's office, \$953; engineer's office, \$3,748; City Hall, \$825; bridges, \$1,250; sewer department, \$1,207; street department, \$10,598; miscellaneous, \$14,634.

STREET CLEANING AND REFUSE DISPOSAL

Recommend That City Clean Streets

Oklahoma City, Okla.—After a thorough investigation of the cost of the street cleaning and sprinkling bureau, Will R. Walters, street superintendent, notified Guy E. Blackwell, Commissioner of Public Works, that the proposition of various firms to do the work be rejected. The City Commissioners recently decided that the forty-five downtown streets that need daily cleaning and sprinkling should be let by contract instead of having the city do the work. Ball & Tracy agreed to do the job for \$1,690 a month. Superintendent Walters ascertained that the city could do the work for \$1,365 a month, less his salary of \$125, and had done it for that amount in July. To clean the entire city streets Mr. Walters says it cost the department only \$2,020 in July. In the street cleaning and sprinkling bureau there are seven teams and eleven paid men, besides the city prisoners working out their fines.

Sprinkling Done at Loss to Contractors

Dayton, O.—So profitable has the street sprinkling contract work been this year that John F. Murphy, who has financed some of the work, stated that the withdrawal of a single additional street from the district would mean the operation of the wagons at serious loss. Residents of streets in the western part of the city have petitioned to be relieved from the sprinkling service in order that they may oil the streets. Mr. Murphy explained to Mayor Burkhardt and Service Director Ely that in case another street is taken from the western district the service of the wagon for this district will have to be discontinued.

Auto Garbage Truck Does Work of Twenty Carts

Atlanta, Ga.—The city of Atlanta's new white auto garbage truck, made on special order, has arrived, and was put in service last week. It has a capacity of five tons and cost \$4,150. It has the White long-stroke gasoline motor and is geared for a maximum speed of 20 miles per hour. The truck will haul as much as 20 ordinary garbage carts, and will be used in the business districts. The carts displaced by it will be put to work in the residence sections, and this will enable the sanitary department to discontinue all the dumping grounds in the Fourth and Ninth Wards. Standing in front of the White Company's place on Marietta street the truck attracted much attention. It is painted bright red with gold trimmings. On each side is the inscription, "City of Atlanta No. 1 Sanitary Department." Chief John Jentzen of the Sanitary Department believes that auto trucks will eventually prove the solution of Atlanta's garbage problem. If this one does the work required of it the Sanitary Department will ask for three more. Four will take care of the garbage in the entire central portion of the city, enabling Chief Jentzen to transfer about 60 carts to the residence section.

Covered Garbage Cans Demanded

Indianapolis, Ind.—The following bulletin concerning the care of garbage has been issued by the Board of Public Health: "The garbage receptacle may easily become a nuisance and a menace to public health. During the summer season decomposition of garbage occurs rapidly, and the odor becomes abnoxious, but perhaps the attraction garbage has for flies is the most serious objection. Flies like garbage, and they go from the garbage can into the kitchen and dining room. If the garbage can is kept tightly covered it is not a nuisance. Every householder can provide himself with a covered garbage receptacle. For his own comfort he ought to do so, but the public demands it of him. If your neighbor has a leaky, uncovered garbage receptacle, you should call the office of the Board of Health, but you should first of all be sure that your own garbage receptacle is covered and watertight."

Winnipeg Accepts Incinerator

Winnipeg, Man., Can.—After remaining idle four years since its completion, the incinerator erected by the Decarie Company, of Minneapolis, was taken over by the city, the agreement being ratified at a meeting of the Council. The city had paid \$75,000 to the company, but had retained the deposit check of \$25,000. The city will return this check, pay the company \$15,000 more, and for this the company will overhaul the plant and place new machinery.

RAPID TRANSIT

Street Cars for Watertown

Watertown, S. D.—A twenty-year franchise has been granted by the City Council to Ferris Brothers, owners of the electric light and power plant in this city, for a street railway with a line to Lake Kampeska. A maximum rate of 15 cents to the lake and of 5 cents to any point in the city south of Tenth avenue north and east of the river, was fixed by the Council. The company has until next July to have its line in operation to the lake, and one year longer to complete its cross-town system. Ferris Brothers announce that work on the lake extension will begin at once, insuring its completion before the camping season next summer.

Claim Municipal Ownership of Subways Is Best

New York, N. Y.—C. Augustus Haviland, a real estate operator of Brooklyn, arrived from Europe with his pockets full of statistics to prove that the result of municipal ownership of subway and trolley lines abroad should be a valuable lesson to the people of this country. "I can't understand," said Mr. Haviland, "why Paris can build its subways and lease them to honorable men, who turn over two cents out of each five-cent fare and one cent out of each three-cent fare to the people for the privilege of equipping and operating subways, while the greatest city in America will dicker with discredited and almost bankrupt concerns to get some one to operate its subways."

Will Test Highway Rights

Richmond, Ind.—The Supreme Court of Indiana will have an opportunity to pass on the relative rights of a traction company and a Board of County Commissioners with reference to the part of a public highway that may be used for interurban purposes. The recent ruling of Judge Fox in connection with the effort of the Wayne County Commissioners to compel the Terre Haute, Indianapolis & Eastern to move its track from within the boundaries of the present national road in order that such tracks will not encroach upon the part of the roadway under improvement favored the traction company. The court held that, while the commissioners had the power to designate what part of the highway should be used, they could not oust the company entirely.

MISCELLANEOUS

Covering Bridge with New Preparation

Pueblo, Colo.—Work of paving the Main street bridge over the Arkansas River with a preparation of oil and gravel has been started by Commissioner Byrnes of the Street Department and a force of men. The idea is to cover the regular board flooring with a sheet of the material, which will not only protect the floor, but also make the bridge more comfortable for traffic. Several barrels of oil, left over from the oiling of Lake avenue and North Main street, are being used in the work and it is believed that it will prove satisfactory, in which case all the wooden-floored bridges in the city will be given the same treatment.

New Suggestions for City Parks

Salt Lake City, Utah.—With a fund of information on the latest advances in park and boulevard work in the United States, Nicholas Byhouwer, superintendent of parks of this city, is back from the recent convention of park superintendents of the United States, held in Kansas City. The superintendent is preparing a report to be submitted to the Park Board at its next meeting that will incorporate many new suggestions relative to park improvements, which he learned through discussions on this subject at the convention. The photographs of Salt Lake's and Utah's beauty spots and attractions, which were installed in a prominent place at the convention, attracted unusual attention, Mr. Byhouwer says, and the people who saw them were earnest in their praise of the wonderful strides that have been made in park improvements in this city and he thinks that Kansas City can teach almost any other city many points in park work and he says he gathered some most valuable suggestions there relative to his work. "Kansas City has already spent \$8,000,000 in park improvements and as a result is one of the most attractive cities of the country," said he. "In playgrounds I observed many things of importance. So far as equipment and apparatus are concerned the best playgrounds that came under my observation were at Denver, while Kansas City has the best swimming pools."

City May Start Municipal Quarry

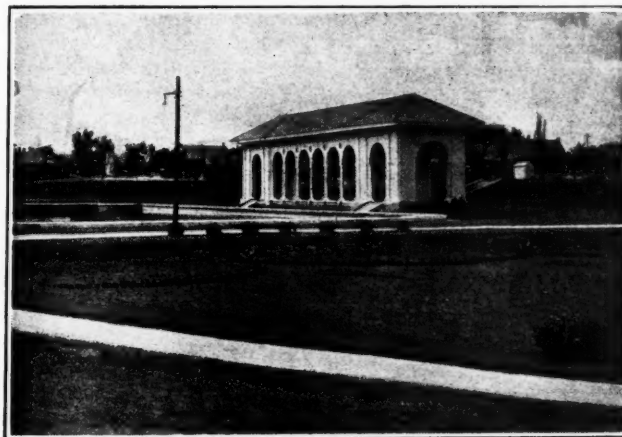
Pasadena, Cal.—Pasadena may have a municipal quarry so that it can fix the price of crushed rock here—at least, in a measure. The city has been offered thirty acres adjoining the pest house property in the Arroyo, the consideration being \$4,500. The property is at present used by Contractor Baldwin for a rock-crushing plant. Mayor Thum strongly advocates the purchase. He believes that if the city is in a position to furnish broken stone, gravel and sand at a fair price it will force outsiders to give the city better service, and street work will not be delayed, as it has been repeatedly this summer, through the inability of contractors to get material. The city already has twenty acres in the arroyo, and this addition would give it fifty acres strewn with fine granite boulders with which to make road material. Baldwin's lease expires in twenty-one months, and the rent he pays is more than 5 per cent on the price at which the land is offered to the city.

Municipal Art Exhibition

Yonkers, N. Y.—The Municipal Art Commission is making arrangements for a municipal exhibition to be held early in September.

Denver Sunken Gardens with New Recreation Building

Denver, Colo.—The Sunken Gardens along the banks of Cherry Creek are again in the municipal limelight on account of improvements recently completed. These consist of a new pavilion of classic architecture, new lawns and terraces and artistic floral designs arranged about the gardens, all of which, combined with the former accomplishments, such as an artificial lake containing scores of small sprays that are illuminated at night with vari-colored lights, make the place very attractive. When one considers that less than three years ago the site of the gardens was a public dumping ground filled with ashes, tin cans, bottles and refuse of every description, the transformation of the tract into a really beautiful spot is indeed a remarkable achievement in the way of civic betterment. The



NEW RECREATION BUILDING IN DENVER PARK

gardens, which are located just west of Cherry Creek fronting on Elati street and on the Cherokee car line, are well worth a visit, especially during the daytime, when the beautiful pavilion and the surrounding premises show at their best. The pavilion, or recreation house, as some choose to call it, was completed by the contractors and formally turned over to the care of the Park Department of the city last week. The contract was awarded in May last to the Kirchhof Lumber Company, their bid being \$6,670, and those who have seen the structure and know the cost of materials declare it is well worth the price. The building was erected to take the place of the temporary frame pergola put in about a year and a half ago, which was a gift to the city by the Westinghouse Electric Company. This building was destroyed in a heavy wind storm last spring.

War on Crickets

Cleveland, O.—On response to complaints from people residing near the city dumping grounds, that crickets living there in untold numbers were invading their homes, destroying carpets and curtains, the fire department spread oil over the dumping ground and set it afire. Millions of crickets are supposed to have been destroyed.

To Clean Out City Squares

Woonsocket, R. I.—The Police Commission has taken steps to do away with the obstruction of the city squares and the further congestion of Main street by instructing the City Clerk to refuse to grant licenses to fakers, hawkers and peddlers to vend their wares at these points. The members of the Commission argue that the few dollars received for these licenses are no return for the damage done. These so-called fakers attract large crowds to the squares and principal points along Main street and, in addition to destroying the dignity that attaches to a city of any size, these crowds block traffic and the members of the audiences that gather put themselves in the way of accidents from street cars, automobiles, wagons and other vehicles. The Commission took its action on the ground that the move would be in the line of civic improvement and would be a benefit to merchants and people from a monetary standpoint and to the public in the matter of keeping them out of danger.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Municipal Water Works—Rates

Johnson-Kahn Co. vs. Thompson, Water Commissioner.—Water used in operating a café, billiard room, bar, barber shop and garage in connection with apartment houses, is used for "business consumption," within New York City water works regulations, permitting a commissioner to require installation of meters. An owner of an apartment house, operating a café, etc., for the use of his tenants, in which meters are ordered by the water commissioner, cannot claim the right to frontage water rates as to consumption outside the café, etc., where the plant is not arranged for the separate service. The New York City ordinance fixing frontage water rates being limited to buildings at least five stories high, an owner of an apartment building exceeding that height is not entitled to such rate. A municipal water meter rate, as against a flat rate, is not per se unreasonable. Inhabitants' right to water service supplied by the city is limited to the right to receive water at reasonable rates without discrimination. Equity will not aid in bringing about inequitable results, and he who seeks equity must do equity. Under the rule that equitable relief does not lie when there is an adequate remedy by mandamus or otherwise, suit does not lie to enjoin discontinuance of water service to a particular consumer on a flat rate, under order by a municipal commissioner for installation of a meter; the consumer having a remedy by mandamus to compel supply of water, or by defense to an action for rents, if a meter is installed. Greater New York Charter giving the commissioner of water supply control of the collection of water rates, enforcement of regulations concerning the use of water, etc., empower him to make reasonable regulations to secure the collection of revenues and proper use of the mains and appliances for distributing water and to prevent undue waste thereof. Regulations for municipal water service to individuals, prohibiting use of hose, rams, syphons, etc., except when the premises are metered, requiring consumers to keep pipes in repair and to prevent waste, etc., are reasonable. Injunction does not lie to control exercise of a lawful official discretion, in the absence of abuse.—New York Supreme Court, 130 N. Y. S., 216.

Ice on Sidewalks—Liability for Injuries

Larson vs. City of New York.—A city did not remove the snow accumulated upon a sidewalk during the mild weather following the storm, and it was worn into ruts and ridges. A later storm covered these ruts and ridges with ice. Held, that one injured from a fall upon this ice could recover from the city, from its failure to remove the first snow, whereby the ice covered a sidewalk already dangerous.—New York Supreme Court, 130 N. Y. S., 257.

Trees—Injury from Moving Houses

Hickok vs. City of Mount Vernon.—In a suit against a city for revoking a permit to move a house along two streets after the house had been moved a short distance, it was error to exclude a showing by the city of prospective injury to shade trees along the second street; showing as to the first street having been properly permitted. Under Mount Vernon City Charter empowering the City Council to prevent injury to trees along the streets, and under an ordinance prohibiting cutting trees or branches thereof without the consent of the owner and the Mayor, a permit to move a house along streets was properly revoked, where it appeared, after the house had been moved a short distance, that injury to trees had already resulted, and that further injury would result.—New York Supreme Court, 130 N. Y. S., 254.

Police Patrolman—Existence of Office

Gersch vs. City of Chicago et al.—There is no statute, ordinance or provision of the Chicago city charter creating the office of police patrolman; and hence a patrolman, alleged to have been improperly dropped from the roll, cannot maintain mandamus to compel his reinstatement.—Supreme Court of Illinois, 95 N. E. R., 630.

Construction of Water Works—Bonds

Wilson et al vs. Mayor and Council of Borough of Collingswood.—Where a borough proposes to construct water works and issue bonds therefor, and the case is one to which the act of 1909, requiring the approval of the State Board of Health, and the act of 1910, requiring the approval of the State Water Supply Commission, are applicable, the approval of those boards must be secured in advance of the election, to authorize the construction of the works and the issue of the bonds to pay therefor.—Court of Errors and Appeals of New Jersey, 80 A. R., 335.

Claim for Injury—Pleading

Collins v. City of Spokane.—It was no defense for failure of a claim for injury against a city to state the residence of the person injured, that the place of residence was known to the officers of the city, and that the claim was rejected on its merits, and not because of the defect in the claim.—Supreme Court of Washington, 116 P. R., 663.

Street Improvements—Time for Performance

Gilsonite Construction Company v. Field et al.—A contract for street paving contemplated that the work should begin in November, and the undisputed evidence showed that under favorable conditions the work could be completed in a month. No work was done by the contractor until late in April following. There was a continuous period of about three weeks in December in which work might have been performed, and there were other shorter periods during the winter and early in the spring. Held to show as a matter of law a want of reasonable diligence on the part of the contractor, rendering the tax bills invalid on that ground.—Kansas City Court of Appeals, Missouri, 138 S. W. R., 676.

Improvements—Assessments—Leased Tidelands

Trimble et ux. v. City of Seattle.—Leases of tide-water lands were issued to defendant in 1899 under the act of 1897, as amended by act of 1899. Laws 1905 provides that all leasehold interests in any tidelands owned by the State in fee may be assessed for the cost of local improvements made by a city, within the limits of which the lands are situated; and Laws 1907 provides that any city of the first class may include leased tidelands within any local improvement district, and may assess the cost of such local improvement against such tidelands, as if the same were private property, but only such interest therein as may be private ownership shall be subject to sale. Held, that defendant's leasehold interests were liable for the expense of municipal improvements within the limits of such districts, by which improvements defendant's interests were specially benefited to an amount in excess of the assessment.—Supreme Court of Washington, 116 P. R., 647.

Change of Street Grade—Right to Damages

In re opening of Tremont avenue in City of New York.—Where the City of New York has taken steps looking to changing the grade of a street and has destroyed the old grade, an abutting owner is entitled to substantial damages for injury to buildings subsequently removed. Where a city takes the fee of a street which was in the abutting owners subject to the public easement, they are all entitled to substantial damages, but not to consequential damages for the lands not taken. A description of property commencing at the intersection of the northern side of a street with a creek shows an intention to exclude the fee of the street.—New York Supreme Court, 130 N. Y. S., 510.

Officers—Grounds of Removal

In re Moran.—Where a firm of which a trustee of a village was a member sold supplies to the village, and bills therefor were audited by a committee of the board of trustees of which such trustee was a member, he violated the village charter, prohibiting any trustee from being interested, directly or indirectly, in any contract to which the village is a party, etc., and he could be removed under Public Officers Law, authorizing removal from office for misconduct, maladministration, malfeasance, or malversation in office.—New York Supreme Court, 130 N. Y. S., 430.

MUNICIPAL APPLIANCES

Acme Automatic Steam Engine

WITH the rapid growth and popularity of the gas engine the impression has become quite general that the small steam engine is no longer an important factor in engineering fields.

This impression is entirely erroneous, so far as concerns the experience of one of the largest manufacturers of small steam engines in this country. The mechanical stoker and similar advances in steam engineering have made the small steam engine indispensable and more essential than ever before. This is particularly true in plants where steam is a source of power, for in such plants the small steam engine proves an auxiliary which is very hard to equal both from the standpoint of economy and efficiency.

The Acme Engine, formerly manufactured by the Rochester Machine Tool Works, of Rochester, N. Y., and now by the Sterling Machine Company, Norwich, Conn., is a well-known small steam engine of this type. The manufacturers have recently added several interesting features to this engine and a general description is given herewith.

These engines are of the vertical 2-cylinder, single acting, enclosed type, with a balance rocking valve, and are splash lubricated. They are built in three series of sizes, the small series being 2½ in., 3 in., 3 5/16 in., 3½ stroke. These small engines are identical in external appearance. The middle series is 3 5/16 in., 4 in., 4 9/16 in., 5 x 5 in. stroke, these four sizes being also identical in external appearance and practically of the same weight. The large series of three engines is 5 in., 6 in. and 7 in., being also of the same external size and general appearance. This range of sizes covers all the applications to which these engines are especially adapted. Because of the extreme simplicity of construction the type of valve which adjusts itself to wear, the large bearing surfaces which are thoroughly well lubricated at all times by a splash of oil, they are espe-

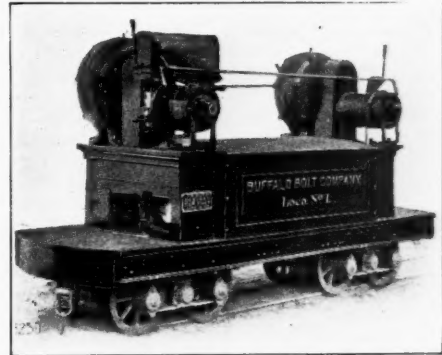
cially well suited to drive mechanical stokers, for direct connection to small gear driven pumps, for driving rock drills and small friction hoists, any variety of belt or direct driven pumping machinery for contractors or irrigation purposes and for small plants.

The character of internal construction is specially interesting, showing as it does the influence of automobile engine practice in many of the details. For example, the crank shafts are drop forged and ground to very accurate size, the connecting rods are of the popular I-beam section bushed with bronze at both ends, the bearing cap on the crank end being held in place by castle nuts and cotter pins as is common in automobile work, the piston rings are of the diagonal cut type, two being placed above the wrist pin and one below. These rings are returned after cutting and ground to accurate size. The valve is a simple one-piece casting which is ground on the outside to fit a very accurately bored chamber and is fastened to the extended valve stem with a cross key in just the same way that the ordinary Corliss valve is fastened. A further point of considerable interest is the matter of automatic cylinder relief valves which are built into the cylinder heads to relieve any water that might otherwise cause damage. The governor is of a simple type, consisting of four main pieces, the action of the weights being modified by means of a hardened roller which travels in a milled arc. The entire governing mechanism is contained in an oil pocket; only the pin to which the lower end of the valve rod is connected being extended through, and further, inasmuch as this mechanism is on the outside of the fly-wheel, it is very readily gotten at. There are but two grease cups requiring attention, all other surfaces being amply lubricated by the internal splash. Provision is also made in the base of the engine for the elimination of the condensation which may collect and the

leakage from the valve stem stuffing box falls down into the engine base through the vent pipe at the end of the engine. The entire series of engines are built with new and accurate jigs on the interchangeable plan.

Storage Battery Locomotive

THE C. W. Hunt Company, 45 Broadway, New York, manufactures a narrow-gauge locomotive for industrial railways, operated by a storage battery, which is claimed to be very economical in operation and maintenance. The weight of the locomotive is five tons and the gauge is 21½ inches. The engine is carried by two trucks pivoted on the car body and the driving power is furnished by two series motors placed at each end of the car on a raised platform. Power is transmitted to the axles through a reduction gear and



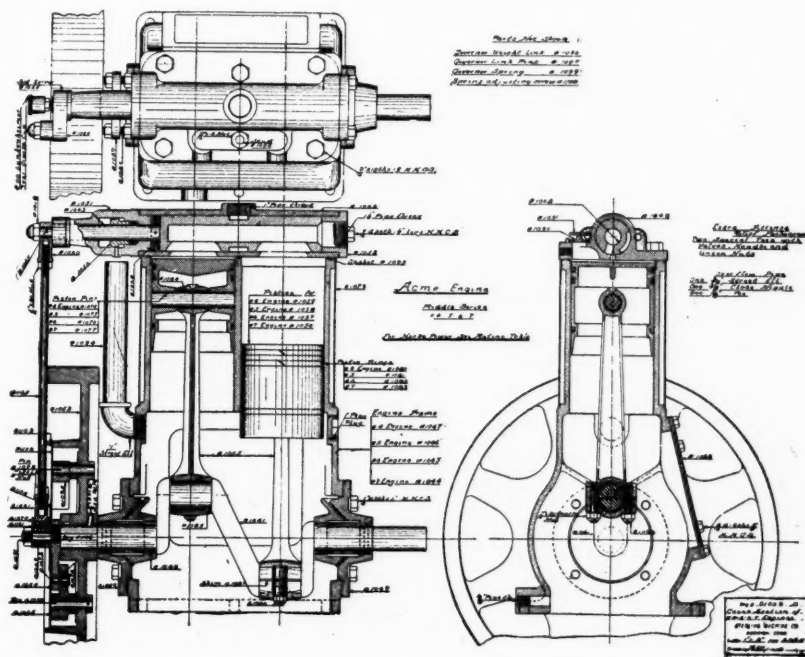
HUNT STORAGE BATTERY LOCOMOTIVE

chain drive. The latter is led by an intermediate pinion over both axle gears. Thus each motor supplies one truck, and every wheel is a driver. A novel feature has been introduced by providing wheels with outside flanges. In turning a curve the outer wheels run on these flanges over a specially constructed rail. The increased circumference of flange over the tread is just enough to prevent slipping and the consequent loss in friction. This reduces the power required to run around short radius curves.

Power is used only when the locomotive is in service; when the controller handle is thrown to the "off" position, all cost for power ceases. As no trolley wires are required, the locomotive can reach any part of the yards, either on permanent or temporary tracks. One man handles the locomotive, and usually does the coupling. The platform of the car is extended at both ends, giving ample space for the driver to stand and by means of extension levers the locomotive may be controlled with equal facility from either end. The platform is sufficiently large to permit an arrangement of the batteries, motors and gearing above the frame, with every part in plain sight for convenient inspection or adjustment. This permits of a simple and rugged construction and reduces the expense of maintenance to a minimum. The operating expenses consist of the pay of one man and the cost of power required to charge the batteries.

The energy required is furnished by a storage battery which can be charged at night or at intervals during the day when the locomotive is idle. The locomotives are equipped with either the chloride accumulator type of battery or with the Edison battery.

Charging is accomplished by connecting the power line to the battery



SMALL STEAM ENGINE FOR AUXILIARY PURPOSES

through a charging plug, which insures proper connections being made. The charging of batteries must be with a voltage suited to the particular battery used, and must not vary materially from the specified voltage or the results will not be satisfactory. When the local current is unsuited to charging a separate generator driven by an independent steam engine or an electric motor is recommended. Current can then be obtained at the needed time and at proper voltage. The motors are so exactly proportioned to the normal output of the batteries, and to the weight of the locomotive, that the batteries are not and cannot be overloaded by the driver, but with normal loads operate at maximum efficiency, and consequently they are durable and highly efficient in regular service.

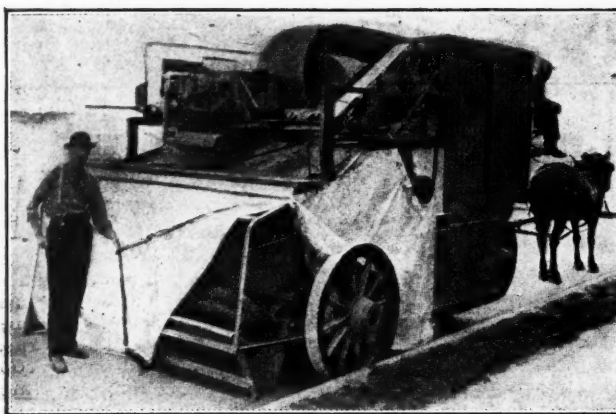
Dumping and Spreading Wagon

THE Troy Wagon Works Company, Troy, O., manufactures a substantial spreading wagon designed to reduce the cost of hauling and save labor in connection with the construction of stone roads. It is intended for use in trains drawn by a traction engine. For this reason it is reversible, that is, can be pulled either way. Bars are provided, which, locking with the next wagon, make it possible to back the whole train. The tires are eight inches wide and the carrying capacity of each wheel is 10,000 pounds. Stone may be spread to any depth from 2 to 18 inches by properly adjusting a grab chain which is hooked into the door chain. If it is desired to dump the load all in one spot, the grab chain may be removed. In this case, in pulling the wagon out, when the door strikes the dump, it swings back and away from the material. The wagon body rests on double vibration bolsters which absorb the shock and strain which come from hauling heavy loads over rough roads. All four wheels are on pivoted axles, like the front wheels of an automobile. The turn is made from the spindle and not the center of the wagon; each wheel meets and overcomes its own obstructions without transmitting the strain or jar to the balance of the wagon. The wagons in a train are connected by a pin which may be used at either end of the wagon.

The Troy Wagon Works Company claim that these outfits, including loading bin, traction engine and wagon, are saving half the cost of hauling to contractors who are using them.



DUMPING AND SPREADING WAGON FOR TRACTION TRAINS



STREET SWEEPER EMPLOYING PNEUMATIC PRINCIPLE

Sanitary Street Cleaner

THE Harn sanitary street cleaner, shown in the illustration, is made by the National Street Cleaning Company, 244 East Third street, Portland, Ore. The machine is of the so-called pneumatic type—that is, the fine dust raised by the rotary broom is carried by air into a chamber, where it settles. It is claimed that the use of water, even for light sprinkling, is unnecessary with this machine. The dirt is removed from the pavement and carried into receptacles by rapidly moving brushes; no sprinkling is done, as the brush is housed and the fan causes suction sufficient to prevent the escape of any dust. The fine dust is caught in a cloth tubular dust collector and dropped into cans on the machine.

Large Storage Batteries

MANY electric light and power companies have installed large storage batteries capable of furnishing sufficient power to provide the necessary service for short periods of time in case of accidents or sudden demands for overloads, as by sudden darkness preceding storms, etc. The New York Edison Company has 46 emergency storage batteries with a capacity of 64,583 kilowatts at the emergency rate. Among the companies that have installed these large emergency batteries are those of New York, Chicago, Boston, Brooklyn, Spokane, Minneapolis, Kansas City and Rochester. The largest storage battery ever installed is that of the Consolidated Gas, Electric Light & Power Company of Baltimore, which will soon be completed. This will insure continuous service for the railroad, light and power

companies which are supplied from the present steam and hydro-electric sources. The "Chloride Accumulator" and the "Exide" battery are used for emergency service. They are made by the Electric Storage Battery Company of Philadelphia. The "Exide" emergency battery has been particularly designed for this service with high discharge rate at high voltage, comparatively small floor space, etc. The advantages gained

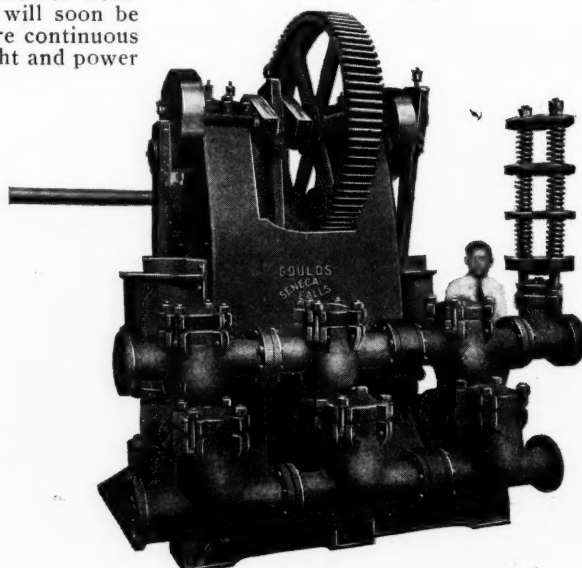
in the service where these batteries have been used is marked.

New Goulds Single-Acting Triplex Plunger Pump for High Pressure—215 to 1,500 Pounds

THE Goulds Manufacturing Company, Seneca Falls, N. Y., has just placed a new high-pressure triplex power pump on the market. This pump, known as Fig. 1585, is similar to the Fig. 1283 type, which is in general use in mines, water works, and with hydraulic elevators, fire protection systems, hydraulic presses, oil pipe lines, etc. The chief difference is in the gearing. As shown by the illustration, the new pump has only one gear and pinion, which are located between the standards. Fig. 1283 had two sets, one on either side of the standards.

Placing the gearing between the standards necessarily lengthened one side of the pump somewhat, and increased the distance between the two valve boxes on that side. Instead of lengthening the pipe connection between the valve boxes on one set and making each set of a different shape, as they are in many pumps, a distance piece is put in as shown. In this way the three sets of valve boxes are kept identical in form and interchangeable.

This duplication of parts is a feature of Goulds pumps that saves valuable time when repairs are needed. It also reduces the number of parts kept in stock by the large user who may be located at a great distance from the factory.



NEW GOULDS HIGH PRESSURE PUMP

NEWS OF THE SOCIETIES

New York City Budget Exhibit.—The Budgetary Publicity Committee, George McAneny, chairman, President of the Borough of Manhattan; William A. Prendergast, Comptroller; John Purroy Mitchel, President of the Board of Aldermen, has issued the following statement regarding the coming Budget Exhibit. The committee headquarters are Room 236, 280 Broadway, and Francis J. Oppenheimer is the press representative:

Three mammoth signs 75 feet long by 17 feet high will be swung from the face of the new Municipal Building, Chambers and Centre streets, high up above the heads of busy New Yorkers September 1, inviting every one of them in bold red and black letters to visit Father Knickerbocker's Budget Exhibit, which will be thrown open to the public on the 2d of next October.

The Budget Exhibit Committee is rapidly perfecting plans for the second annual Budget Exhibit, which will be given all through October in the old Tefft-Weller Building, 330 Broadway. Three entire floors will be devoted to this municipal exposition, the same as last year, when nearly 800,000 interested citizens and taxpayers, according to Borough President McAneny, visited the exhibit.

Father Knickerbocker will show on these three spacious floors, by charts, diagrams and physical models (not to mention the interesting moving pictures he is having prepared), every one of his municipal problems, and also his modern methods of accounting for the expenditure of \$174,000,000—the amount required to run New York City this year.

You will not wonder that the expenditure of this large amount is necessary to maintain New York City when you realize that it is the second largest city in the world, with a population of 5,000,000. This is a 39 per cent increase in 10 years, or 1,300,000 human beings, equivalent to the combined population of Boston, Kansas City and San Francisco. Only three States in the Union have a greater population, our own New York, Pennsylvania and Illinois.

Do you realize that the area of New York City is 327 square miles, that it contains 5,000 miles of highways, 2,000 miles of sewers and 341 miles of waterfront? In 1910 alone \$225,000,000 was invested in building operations. There has been 136,000 births in 1910—a birth every four minutes, a death every seven minutes and a marriage every eleven minutes.

Eight hundred thousand children attend public schools in New York City, and \$30,000,000 is expended annually on educational work. There has been spent \$140,000,000 for the 45 bridges over navigable streams. Assessed valuation (full value) of taxable real estate in New York City is \$8,000,000,000 in addition, \$2,000,000,000 exempt, such as Government, State, city and church property. Fifteen and one-half millions expended for police protection and \$8,250,000 for fire protection in 1911. New York City gives \$10,000,000 annually out of the city treasury for public charities.

Working under the direction of a Committee on Budgetary Publicity, the Budget Exhibit Committee, has about agreed as to the appropriation of space to be given the various departments which are now actively engaged preparing their exhibits which will be

hung on the three hundred odd chocolate colored burlap screens. Many surprises are promised to the citizens of New York who are eagerly waiting to see what the departments are going to report in the way of progress since the last Budget Exhibit. The departmental exhibits will all be ready for installation by the 20th of September.

To secure more uniformity of important budgetary facts, and to assist the departments in the work of preparing their exhibits, the Budget Exhibit Committee is having prepared a series of very novel charts, which will be repeated in every exhibit, and which will show through a series of phantom cubes:

1. A comparison of the departmental appropriation for 1911 with the total budget for that year. 2. A comparison of the classified expense items of the department, with the total appropriation for 1911. 3. The relation of bureau or divisional appropriations to the total departmental appropriation (the general functional organization of the department will be shown on this diagram).

New Yorkers may also be given an opportunity this year to learn how a number of other large cities are governed, for on the completion of the International Municipal Congress and Exposition to be held in Chicago September 18 to 30 most all of their interesting exhibits will probably be brought to New York City in company with the exhibits New York City will send to Chicago by special car on the 16th of September.

League of American Municipalities.—The programme of the fifteenth annual convention of the League of American Municipalities, to be held in Atlanta, Ga., October 4-6, 1911, has been announced by Secretary John MacVicar as follows:

Address of Welcome—Courtland S. Winn, Mayor, Atlanta.

Response and President's Address—Darius A. Brown, President, and Mayor of Kansas City, Mo.

Long Time Bonds for City Improvements—T. C. Thompson, Mayor, Chattanooga, Tenn.

Law Enforcement—Marcus B. Culum, Mayor, Duluth, Minn., and Thomas Maloney, Mayor, Council Bluffs, Ia.

Municipal Insurance Bonds—Wilson J. Vance, Secretary to the Mayor, Newark, N. J.

The Future City—Samuel Carlson, Mayor, Jamestown, N. Y.

City Government by Commission—Ford H. McGregor, Municipal Reference Bureau, the University of Wisconsin, Madison, Wis.

The Board of Public Welfare of Kansas City, Mo.—Jacob Billikopf, Member of the Board of Public Works, Kansas City, Mo.

What a Live City Can Do Under an Antiquated Charter—J. C. Haynes, Mayor, Minneapolis.

Municipal Government, Its Needs and Requirements—J. J. Keeley, Alderman, Jackson, Mich.

The Standardization of Municipal Business—Fred H. Cosgrove, Comptroller, Omaha, Neb.

Address—R. G. Rhett, Mayor, Charleston, S. C.

Ontario Municipal Association.—The Ontario Municipal Association are holding their annual meeting in Toronto on August 31 and September 1. An abbreviated program of the meeting follows:

Wednesday, August 30—8 p. m.,

meeting of the executive at the Queen's Hotel, Toronto.

Thursday, August 31—9 a. m., registration of delegates. 10 a. m., convention opens; address of welcome, His Worship Mayor Geary, Toronto; presidential address, President Hopewell, Mayor of Ottawa; address by W. A. Clark, chairman rural section; report of executive, financial report, appointment of committees on resolutions, communications, questions and suggestions, resolutions; Tax Reform, address by A. B. Farmer, secretary Tax Reform League. 1 p. m., luncheon to delegates by city of Toronto. 1.30 p. m., meeting of committee on resolutions. 2 p. m., The Highway Improvement Situation in Ontario, address by W. A. McLean, C. E., provincial engineer of highways; discussion, recommendations and resolutions. 3 p. m., The Local Improvements Act, address by W. B. Wilkinson, law clerk Legislative Assembly; discussion and resolutions. 4 p. m., County Associations, address by W. C. Caughell, secretary Elgin Association. 4.30 p. m., Town Planning Suggestions for Canadian Municipalities, illustrated address by J. P. Hynes, of the Toronto Civic Guild. 7 p. m., meeting of executive and committee on resolutions, Queen's Hotel.

Friday, September 1—9.30 a. m., Municipal Auditing, address by J. W. Sharpe, provincial municipal auditor; discussion and resolutions; Hydro-Electric Power and Its Development, address by representative of Provincial Power Commission. 10.30 a. m., discussion on relations between board of light and water commissioners and municipal councils as to charges for water and light for municipal purposes; opening address by Geo. Geddes, Water Commissioner, St. Thomas, Ont.

11.30 a. m., report of committee on resolutions. 12.30 election of officers.

Health Officers' Association of Vermont.—The thirteenth annual school of instruction for the health officers of the State of Vermont was opened in the assembly hall of the high school building, Burlington, August 21, with an attendance of about 150 town officers and others interested. Dr. C. S. Caverly, of Rutland, chairman of the State Board of Health, presided, and Dr. C. F. Dalton, the local health officer, was in charge of arrangements for the session. The speakers were Mayor Robert Romerts, of the city of Burlington, President Guy Potter Benton, of the University of Vermont, and Secretary Henry D. Holton, of the State Board of Health. Lieutenant-Governor Leighton P. Slack, of St. Johnsbury, was to have delivered an address, but he was unable to be present.

Dr. Caverly first introduced Mayor Roberts, who extended to the visitors the hospitality of the city of Burlington. "Good people," said the Mayor, "are always welcome, but it is particularly gratifying to open our doors to a body of men who bring healing."

Mr. Roberts then spoke of the importance of proper regulation of sanitation and the difficulty of enforcing it. He said that the rule of the health officer is more autocratic than that of the Czar of Russia, and that it is well so. The recent triumphs of sanitary science, said he, are the most important advances that modern progress has made.

Dr. Caverly then spoke briefly, pointing out that the State Laboratory of Hygiene is the only headquarters which the State Board of Health now has. He also touched upon the work of the

State Board. "The public health," said he, "is indeed the public wealth."

He then introduced President Benton, who emphasized the fact that the problems considered by the health officers are of national scope and importance.

Referring to the place of the University of Vermont in medical education in this State he said that it should educate doctors who will not only cure disease but who will also co-operate with other forces to prevent it. He declared his belief that the physicians of the future will be employed not so much to cure diseases as to prevent them.

President Benton made a strong plea for the study of public health problems in a broader way, emphasizing very strongly indeed the necessity for better knowledge and greater care in the training of children. In this connection he laid particular stress upon the proper construction of school buildings, their lighting, their decoration and the choice of seats and desks. He said that there is apt to be too much of a feeling of complacency; we are inclined to be satisfied too well with things as they are. His address closed with a strong tribute to the work of Dr. H. C. Wiley, whose name drew forth hearty applause.

At the close of President Benton's address Dr. Caverly said: "The University of Vermont has discovered good material for a president. I wish that his appeal might be repeated before the school directors and health officers of every town in the State." Dr. Caverly then called upon Dr. Holton, who devoted his entire time upon the platform to a discussion of the work of the State Board of Health and its aims.

"The work that men do for the public health," said Dr. Holton, "is a work of love."

"The results of the work of the State Board of Health have been most satisfactory and you local health officers have been of the greatest help."

Dr. Holton then pointed out on the charts some statistics showing the improvement in health conditions, but called attention to the fact that there are three deaths from tuberculosis for every case of the disease reported.

He urged the importance of frequent examination of samples of water supply and spoke of the improvement made in the distribution of milk. Often the trouble with milk, he said, originates in the unsanitary condition of the dishes in which housekeepers store the milk.

Following this he told of the advances toward greater purity of foods, the addition of fire escapes to buildings throughout the State, the war upon spitting in public places, the prevention of blindness in the newly born and the crusade against infantile paralysis.

"Pedagogy and medicine," he declared, "must join forces to prepare children for citizenship."

Dr. Holton then called attention to the dangers from flies. No flies, said he, have been found farther than four-fifths of a mile from their place of birth. They feed upon all sorts of human and animal filth, transferring the germs of disease to our food and drink.

The program carried out on the second day of the meeting was as follows:

Paper—"Inspection of Public Buildings," by Prof. W. C. Hanson, M.D., Assistant Secretary Massachusetts State Board of Health.

Discussion—M. P. Stanley, M.D., White River Junction; C. F. Dalton, M.D., Burlington.

Paper—"Infectious Diseases," by

George M. Kober, M.D., Professor Georgetown University, Washington, D. C.

Discussion—C. F. Ball, M.D., Rutland; C. M. Campbell, M.D., Rochester. Paper—"Vital Statistics," by F. L. Hoffman, statistician Prudential Insurance Company of America.

Discussion—H. B. Whittier, City Clerk, Rutland; George B. Hulburd, M.D., Jericho.

Paper—"Water Supplies, Their Sources and Analyses," by C. P. Moat, chemist, Laboratory of Hygiene.

Discussion—William Wilson, engineer in charge of filter plant, Burlington; F. E. Clark, M.D., president Board of Health.

Ohio Good Roads Federation.—The State Highway Department, co-operating with the Federation, will have a Roads Exhibit at the State Fair to be held in Columbus, August 28-September 1. Displays and models will be furnished by the Office of Public Roads, Washington, D. C. Road materials such as stone, gravel and brick, fillers, binders, etc., supplied by dealers and manufacturers will be displayed. Catalogues, pamphlets and other literature regarding road materials and machinery will be distributed. The Roads Department exhibit will be in the Vehicle Building.

Civic League of St. Louis.—The League has recently published a directory of the various organizations in St. Louis, Mo., interested in public affairs. Information is given of the place of meeting, the objects, frequency of meetings, number of members, annual dues, date of annual meeting and executive officers of each society. The book contains 43 pages and data about five societies are given on each page.

Calendar of Meetings

- September 4-6.**
Montana State Firemen's Association.—Annual Convention, Billings.—E. M. Nelson, vice-president, Billings, Mont.
- September 5-6.**
Seven County Volunteer Firemen's Association.—Annual Convention, Corning, N. Y.—P. E. Decker, Secretary, Athens, N. Y.
- September 5-8.**
Pennsylvania State Firemen.—Annual Convention, York, Pa.—James C. Baxter, Chief of Fire Dept., Philadelphia, President.
- September 11-14.**
Pacific Coast Association of Fire Chiefs.—Nineteenth Annual Convention, Vancouver, B. C.
- September 12-15.**
International Association of Municipal Electricians.—Annual Convention, Youngs Hotel, Atlantic City, N. J.—Clarence R. George, Secretary, Houston, Tex.
- September 13-15.**
New England Water Works Association.—Annual Convention, Gloucester, Mass.—Willard Kent, Secretary, Narragansett Pier, R. I.
- September 14-15.**
New Jersey State Firemen's Association.—Annual Convention, Atlantic City, N. J.—Wm. Exall, Secretary, 86 Bruce street, Newark, N. J.
- September 14-15.**
League of Virginia Municipalities.—Annual Meeting, Cape Charles.—L. C. Brinson, Secretary, 515 Henry Street, Portsmouth, Va.
- September 18-30.**
International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.
- September 18-October 1.**
Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.
- September 19-22.**
International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.

September 19-23.

American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.

September 19-22.

American Association of Public Accountants.—Annual Convention, San Francisco, Cal.—T. Cullen Roberts, Secretary, 56 Pine street, New York, N. Y.

September 24-30.

International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.

September 25-27.

National Firemen's Association.—Annual Convention, St. Louis, Mo. Capt. Bert Fisher, Secretary, 1252 East Forty-sixth street, Chicago, Ill.

September 26-29.

American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.

November 20-24.

American Association for Highway Improvement.—First Annual Convention, Richmond, Va.—Logan Waller Page, President, United States Office of Public Roads, Washington, D. C.

PERSONALS

ATWOOD, THOMAS C., New York, for four years Division Engineer of Board of Water Supply in charge of design and construction of Bronx Division of Catskill aqueduct, has been appointed Division Engineer of Department of Water Supply, Gas and Electricity of New York City, in joint charge with E. G. Manahan, of the filtration plant to be constructed for Croton water supply.

BEAVERS, JAMES L., Atlanta, Ga., has been elected Chief of Police.

BURKE, WM. F., Trenton, N. J., has been elected Chief of Department of Parks and Public Property.

CAREY, J. J., Lawrence, Mass., has been appointed State Building Inspector by Governor Foss.

COREY, R. H., Portland, Ore., has resigned as Assistant Engineer in Water Department to accept position with Pacific Light and Power Co.

DOCKERTY, DANIEL, Stanley, N. D., has been elected Police Chief by the Council, to succeed James Brown resigned.

DONNELLY, F. W., Trenton, N. J., has been selected president of Commissioners in charge of the government. The office carries with it the honorary title of Mayor of the city. City Controller Edward Lee is head of the Revenue and Finance Department; J. R. Fell was chosen head of Department of Streets and Public Improvements; Geo. La Barre, head of Department of Public Safety, and Wm. F. Burke, Chief of Park Department.

FLETCHER, AUSTIN B., San Diego, Cal., has been appointed State Highway Engineer of California at a salary of \$10,000 per annum.

HUDSON, LEO, Haverstraw, N. Y., has been appointed Consulting Engineer for the proposed sewerage system at College Hill, Pa.

MANAHAN, ELMER G., New York, of the firm of Hering & Fuller, consulting engineers, New York City, has been appointed Division Engineer of Department of Water Supply, Gas and Electricity in joint charge with T. C. Atwood.

STRONG, FRED S., Syracuse, N. Y., has been appointed Engineer of State Highway Commissioner to succeed F. W. Starr, resigned.

WATSON, WILBUR J., Cleveland, O., expert Bridge Engineer, has been appointed Supervising Engineer for the new McCallie Ave. viaduct.

YOUNG, W. W., New York and Philadelphia, Pa., has been appointed Consulting Engineer for the Bronx Valley Sewer Commission.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Miscellaneous business is well maintained. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Producers report the outlook for new business encouraging, but the aggregate recently placed is comparatively small. Quotations: 4 to 6-inch, \$23; 8 to 12-inch, \$22; over 12-inch, \$21. New York: Manufacturers report a better feeling and more activity in trade. Inquiries are better than for several months. The gradual stiffening in pig iron has apparently caused consumers of pipe to become more interested, especially those who have been waiting in hopes of buying at the bottom. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Lead is dull and the recent manipulation is believed to have been abandoned. The leading interest is still asking 4.50c., New York. Outside sellers are asking 4.42½c., St. Louis, and there is every reason to believe that even this price is being shaded.

Trinidad Liquid Asphalt.—The Barber Asphalt Paving Company, Philadelphia, Pa., has published in pamphlet form a paper by Dr. Albert Sommer on "Trinidad Asphaltic Petroleum and Its Use as a Road Material. The pamphlet contains nine pages of reading matter and one page of illustrations of the Pitch Lake Trinidad.

Fort Wayne Bulletins.—The Fort Wayne Electric Works, Fort Wayne, Ind., has recently published the following bulletins: No. 1130, Northern Type K Direct Current Motors; No. 1131, Series Incandescent Street Lighting Systems; No. 1132, Multiphase Revolving Armature Alternators; No. 1133, Single Phase Watt-Hour Meters, Type K 4.

General Electric Bulletins.—The General Electric Company, Schenectady, N. Y., has recently issued the following bulletins: Nos. 4837 to 4843, forming a series illustrating and describing in detail all of the circuit breakers manufactured by the company. No. 4872, describing an outfit for the purification of transformer oil of all kinds. No. 4866, describing Thompson edgewise instruments for switchboard service. No. 4858, describing single-phase repulsion motors. No. 4849, describing various combinations of alternating and direct current generators and motors ranging in capacity from 95 kilowatts to over 7,000 kilowatts. No. 4868, describing rotary converters for railway and lighting, in capacities ranging from 25 to 2,500 kilowatts. No. 4867, describing electric locomotives for switching and light freight service.

Auto Engine.—The Macon Fire Department have had an auto chemical engine built by the American La France Company in service over two months. The machine has given much satisfaction to Chief Jones and the men who handle it. The La France Company claims that their machine is built in an exceptionally substantial manner, suitable for hard service in fire departments. Among the features pointed out as of special merit are the following: The track is very wide, 70¾ inches, center to center of rear outside tires. The rear tires are dual. The wide track permits carrying the load low, thus contributing to safety. The overhang in the rear is slight, a feature made possible by the 140-inch wheel base.

Squeegee Street Cleaner.—The South Bethlehem Borough Council recently purchased a squeegee machine. The choice of the machine over a street flusher was based on the following figures submitted by Councilman Rankey, of the street committee: Assuming that you will operate the machine three days per week, 34 weeks per year, the following estimates will give you annual cost of street cleaning by hand and by machine:

Hand sweeping—6 men at \$1.50 per day, 6 days per week.....	\$54.00
Hauling sweepings—1½ days per week, at \$4 a day.....	6.00

Total cost per week hand sweeping.....	\$60.00
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Total cost per year (34 weeks) flushing machine.....	\$2,040.00
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Flushing Machine.

Machine cost—3 days per week, at \$8.14 per day.....	\$24.42
3 sweepers at \$1.50 per day, 6 days per week.....	27.00
Hauling sweepings—1½ days at \$4 per day.....	6.00

Total cost per week.....	\$57.42
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Total cost per year (34 weeks) flushing machine.....	\$1,952.28
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Squeegee Machine.

Machine cost—3 days per week, at \$6.45 per day.....	\$19.35
3 men at \$1.50 per day, 6 days per week.....	27.00
Hauling sweepings—1½ days at \$4 per day.....	6.00

Total cost per week.....	\$52.35
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Total cost per year (34 weeks) squeegee machine.....	\$1,779.90
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The above figures show an annual saving by using the squeegee machine as compared with hand-sweeping of \$260.10, or 21 per cent of first cost of machine; and by using the squeegee machine, as compared with the flusher, of \$172.38, or nearly 14 per cent of first cost of squeegee machine.

Garbage Incinerator.—The garbage incinerator for Saranac Lake, N. Y., will be ready for operation December 1, if the Dixon Company, of Toledo, O., makes good on the contract signed with it by the Board of Village Trustees last week. The incinerator will be erected on the present garbage dump, on the side nearest the village. The Dixon Company, manufacturer of the consumer, say they will start work soon. The incinerator will have a capacity of 15 tons a day, and will be run at much less than capacity to take care of the present refuse of the village. It will be of fireproof construction throughout. The building will be of brick, with concrete floor and reinforced concrete approach. A steel stack 100 feet high will carry the smoke high above the ground and will provide a strong draft for the furnaces. The consumer, with approach and building complete, will cost \$9,000. Mr. Sneider, who negotiated the contract with the Village of Saranac Lake, says that work will begin on the new building about September 1, or as soon as the plans for the incinerator can be made in detail.

Sewer Pipe.—The Sandstone Brick & Sewer Pipe Company, with a capital stock of \$80,000, has completed its plant in Calgary, Alberta, and begun to turn out product.

Cement Plant.—On August 15 the Tidewater Portland Cement Company formally opened its large Portland cement plant at Union Bridge, Md. Governor John K. Tener, of Pennsylvania, was present and threw in the switch that put in operation the machinery of the new plant. A special train brought a large number of guests from Baltimore, New York, Pittsburgh and other points to witness the inauguration of the new enterprise, which is one of the largest in Maryland. The plant of the Tidewater Portland Cement Company is located at Union Bridge, Md., 45 miles from Baltimore, on the line of the Western Maryland Railroad. It is exceptionally well situated, as it commands both the markets of Baltimore and Washington, and is also near enough to tidewater to reach most of the Atlantic seaboard cities at a low freight cost. The plant has a capacity of 1,000,000 barrels of Portland cement and 25,000 tons of hydrated lime annually. In addition to the above, the Tidewater Portland Cement Company will manufacture a waterproof cement and also White Portland cement. The hydrated lime plant has been in operation for about a year, and its product is now well known in its territory. The raw materials at Union Bridge consist of an unusually pure limestone, resembling marble in appearance, and a volcanic shale. These two materials are found side by side, within a hundred yards of the mill, and the deposits are practically inexhaustible.

Auto Fire Apparatus.—The standing committee of the First Hose Company, Hagerstown, Md., has recommended the purchase of a Robinson automobile fire engine at their fire house, the most centrally located of any in the city. The engine is a handsome and powerful piece of machinery, having 110 horsepower and a speed capacity of 30 miles per hour. It weighs between five and six tons, and is capable of pumping 800 gallons of water per minute. It is to be equipped with electric lights and solid rubber tires. The cost of the new engine will be \$9,500 complete. This will be the only motor fire engine in town.

Foreign Trade and Magazine Advertising.—Consul James O. Laing, Valetta, Malta, reports that the advertising matter in American monthly magazines and weekly papers is an aid to American trade in this district. Several weeks ago he sent a package of American magazines and weeklies to a Maltese importer who was ill. He requested more, and said he had gotten some good ideas about American goods from them. This has started, on a small scale, a kind of informal circulating library, as other merchants want the magazines and read the advertising matter eagerly. They pass from hand to hand and are finally returned to the consulate.

Central Heating Plant.—A franchise has been granted by the Board of Public Works, Gary, Ind., for 25 years to T. B. Dean, of Chicago, for a central heating plant that will supply both business houses and residences here with heat.

Auto Trucks.—The Mack Brothers Motor Car Company, Allentown, Pa., expects to increase its productive facilities 50 per cent over those of 1910 and consequently will enlarge its plant about one-third so as to be able to produce between 1,600 and 1,700 trucks.

PATENT CLAIMS

999,676. **SPRAYING APPARATUS.** John F. Schoelles, Elmira, N. Y., assignor to Field Force Pump Company, Elmira, N. Y. Serial No. 540,075.

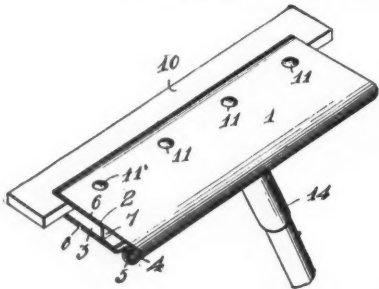
The combination, with a liquid forcing apparatus, of a flexible connecting pipe leading therefrom, a horizontal distributing pipe provided with a plurality of spraying nozzles coupled to said connecting pipe, a



bar parallel to said pipe mounted in bearings attached to the apparatus and adapted to side and turn in said bearings, arms projecting from said bar upon the ends of which the distributing pipe is fastened, a hand-lever attached to said bar, a toothed bar fastened to the apparatus parallel to said bar, and means on the lever for engaging the toothed bar.

999,442. **SQUEEGEE-HEAD.** William A. Field, Chicago, Ill. Serial No. 556,266.

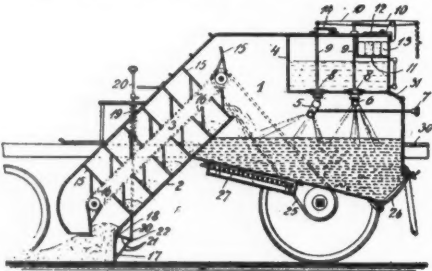
A squeegee head comprising jaws with portions of their length folded over and contacting with other portions of their length, one of the folds having a longitudinal rib struck upwardly therefrom, the fold of the other jaw having its inner end bent at right angles therewith and adapted to contact with the first mentioned fold so as to space the two jaws apart and limit the movement of the same toward each other,



said right angular bend also providing a fulcrum for the jaws, the rear ends of each of the two jaws being rolled to provide hinge joints of different diameters so as to permit of one roll being slidably and detachably connected to the other roll, each of said jaws having a plurality of registering openings therein; bolts inserted in said openings, thumb nuts on said bolts, said bolts adapted to limit the rearward movement of the squeegee, and one of said jaws having a socket.

999,445. **SNOW-MELTING MACHINE AND METHOD OF OPERATING SAME.** Samuel Friedman, New York, N. Y. Serial No. 602,181.

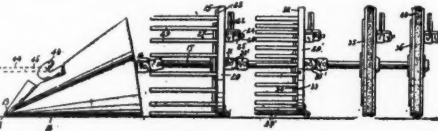
A snow removing apparatus comprising in combination a receiving tank, a chute, and means in said chute for conveying snow



to said tank, a plow secured to the end of said chute, and spring acting means secured to said plow to permit the same to pass obstructions, as and for the purposes set forth.

999,652. **APPARATUS FOR CLEANING SEWER-PIPES.** Gábor Jamnicky, New York, N. Y. Serial No. 625,250.

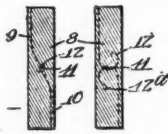
In an apparatus for cleaning sewer pipes, the combination with a digger, of a plurality of buckets pivotally connected to each other and said digger, each of said buckets comprising a main frame, two side frame portions fulcrumed thereto, a plurality of



grate bars attached to said main frame and said side frame portions at right angles to the plane of said frame portions, and a perforated rear wall, and a plurality of scrapers pivotally attached to the last in the series of said buckets, substantially as and for the purpose specified.

999,663. **REINFORCED CONCRETE CONSTRUCTION.** Daniel B. Luten, Indianapolis, Ind. Serial No. 107,812. Divided, Serial No. 217,767. Divided. Serial No. 336,832.

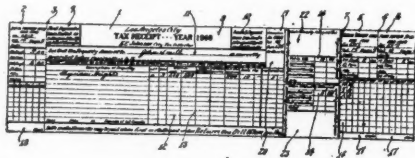
A structural member of hardened plastic material with two tension members embedded, provided with overlapping curved ex-



tensions substantially tangential to the members, the curves of said extensions being of decreasing radii.

999,818. **TAX-RECEIPT FORM.** Charles B. Mahone, Los Angeles, Cal. Serial No. 464,312.

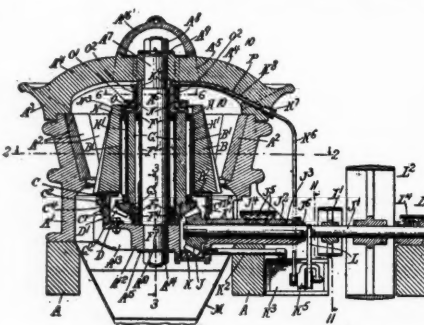
A tax receipt form comprising a main portion sub-divided by ruled lines into an upper central portion containing venue designations, a portion at each end of the central portion containing first and second payment due and delinquent designations, respectively, a lower portion containing property designations, an intermediate portion containing party designations, an



upper inner portion containing assessment designations, a lower inner portion beneath the upper inner portion providing a first payment blank and an upper outer portion providing a total tax blank, and a lower outer portion providing a second payment blank, an inner second payment coupon, an outer first payment coupon and a total tax coupon, said main portion and coupons each bearing common identifying data.

1,000,049. **STONE CRUSHER.** Edgar B. Symons, Milwaukee, Wis., assignor to Smith & Post Co., Milwaukee, Wis., a Corporation of Wisconsin. Serial No. 375,762.

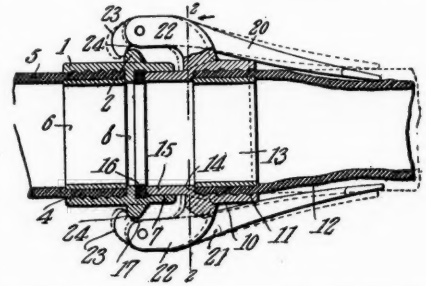
In a stone crusher, the combination of a hollow crusher head with oscillatory mechanism therein, a driving mechanism associated therewith, a case containing said



driving mechanism, said case opening into the hollow of the crusher head, and closures for the case and chamber so as to close them and an oil circulating mechanism connected above and below to such chamber and case.

999,946. **FIRE-HOSE COUPLING.** Joseph C. Babst and Henry H. Pierce, Barnesville, Minn. Serial No. 546,381.

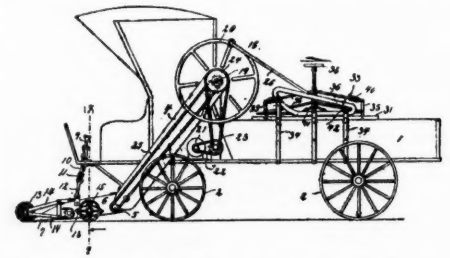
A hose coupling comprising a female member having one end of its interior threaded and the other end smooth, the smooth end being formed at the inner end thereof with a groove, an annular rib separating the threaded portion from the smooth portion, said member being formed with an external rib having a plurality of notches therein and a plurality of springs covering said notches, a male member having at its rear end a threaded interior de-



fined at the forward end thereof by an annular shoulder, a tubular extension in advance of said shoulder adapted to fit into the smooth portion of the other member, said male member having a plurality of outwardly and forwardly extending arms, levers mounted in said arms and having cam faces adapted to engage the annular rib of the female member, said levers being adapted to be expanded by the pressure within the hose, to draw the two members of the coupling together.

1,000,202. **STREET-CLEANING MACHINE.** Ernest de la Shaler, Pittsburg, Pa. Serial No. 607,796.

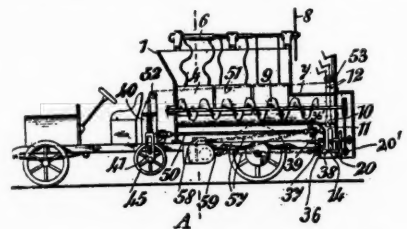
In a street cleaning machine, the combination of a wheeled body, and means for spreading the material after the same is received in the body and comprising a spreader frame, guide members upon which



said frame is adapted to move, means for reciprocating the frame horizontally with respect to the body of the machine, spreading devices supported by the spreader frame, and means for raising the spreader frame upon its guides at predetermined intervals of time as it is reciprocated.

1,000,004. **DISTRIBUTER FOR SAND OR THE LIKE.** Werner Huber, Sihlbrugg, Switzerland. Serial No. 578,695.

An apparatus for carrying and distributing sand and like material comprising a vehicle, a hopper mounted thereon, a conveyor fed from the hopper, rotatable scattering members supplied by the conveyor,



a vertically adjustable operating wheel mounted on the vehicle, multiple gearing connected with the scattering members, and driving mechanism connecting the operating wheel with the multiple gearing.

1,000,545. **PROCESS FOR MIXING AND PREPARING HYDRAULIC CEMENT CONCRETE AND THE PRODUCT THEREOF.** Logan Waller Page, Washington, D. C. Serial No. 623,804. (Dedicated to the public.)

The process of preparing hydraulic cement concrete which consists in mixing cement, sand, aggregate and water in the usual way and then adding to such mixture before it begins to set a quantity of nonvolatile mineral oil.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO.
STREET IMPROVEMENTS				
Minnesota	Minneapolis	Sept. 1, noon	Dredging in Cedar Lake and filling low lands and boulevards adjacent.	J. A. Ridgway, Secy. Park Board.
Florida	Jacksonville	Sept. 1, 10 a.m.	Grading Pearl St. boulevard.	County Commissioner Conroy.
New York	Middletown	Sept. 1, noon	Constructing 8,460 yds. brick pavement.	J. A. Korschner, Comr. Pub. Wks.
Ohio	Dayton	Sept. 1, 10 a.m.	Macadamizing 1.3 miles road, cost \$13,000.	County Commissioners.
New Jersey	Haledon	Sept. 1	Macadamizing 4 streets.	L. L. Hines, Boro. Clerk.
Illinois	Harrisburg	Sept. 2	Con. 2½ mi. brick pave. on 4-in. conc. found. with conc. curb.	C. S. Wills, Township Clerk.
Ohio	Woodfield	Sept. 2	Paving with brick 1 mile of road.	County Commissioners.
Ohio	Springfield	Sept. 2	Macadamizing 2.2 miles road, cost \$15,000.	County Commissioners.
New York	Syracuse	Sept. 2, 1 p.m.	Constructing 3.27 miles road.	F. E. Bogardus, Co. Supt. Hwys.
Illinois	Harrisburg	Sept. 2	Constr. 2½ miles brick paving on 4-in. concrete foundation.	C. S. Wills, Township Clerk.
Ohio	Wakeman	Sept. 2, 10:30 a.m.	Constr. limestone macadam road.	W. G. Ferber, Clerk. Bd. Trustees.
Wisconsin	West Allis	Sept. 2, 8 p.m.	Grading, curbing and macadamizing road.	F. C. Douville, Chm. Bd. Pub. Wks.
West Virginia	Fayetteville	Sept. 2	Constructing cement sidewalks.	R. H. Dickinson, Mayor.
Kansas	Winfield	Sept. 4, 8 p.m.	Constr. brick pavement on Bliss Street.	G. W. Sloan, City Clerk.
Iowa	Moorland	Sept. 4, 8 p.m.	Constructing 500 ft. sidewalk.	L. S. Papousek, Town Clerk.
New Jersey	Laurel Springs	Sept. 4	Constructing concrete sidewalks.	S. L. Burgess, Township Clerk.
Ohio	Logan	Sept. 4, 1 p.m.	Macadamizing 1.6 miles road, cost \$5,300.	County Commissioners.
Pennsylvania	Kingston	Sept. 4	Constr. 2,665 sq. yds. paving; 2,050 lin. ft. curbing and 430 lin. ft., 12-in. terra cotta pipe sewer and appurtenances.	R. C. Hull, Chm. St. Com.
Texas	Galveston	Sept. 5, 11 a.m.	Furn. 4,750 cu. yds. mudshell for county roads near League City and Dickinson.	J. W. Murch, County Auditor.
Delaware	Wilmington	Sept. 5, noon	Constructing 6 miles road; 5 contracts.	County Highway Com.
Ohio	McConnellsville	Sept. 5, noon	Macadamizing 1.23 miles road, cost \$9,189.	County Commissioners.
Connecticut	Stamford	Sept. 5, 8 p.m.	Constructing 6,500 sq. yds. brick pavement.	City Clerk.
Ohio	Cleveland Hghts.	Sept. 5	Imp. Wilton Rd. with brick, asphalt or macadam.	H. H. Canfield, Village Clerk.
Mississippi	Aberdeen	Sept. 5, 2 p.m.	Grading 193,649 cu. yds.; bldg. culverts including 2,381 cu. yds. concrete and laying about 2,400 ft. 15 to 36-in. clay pipe.	Road Commissioners, Dist. No. 4.
Indiana	Vincennes	Sept. 5, 2 p.m.	Constr. 5,380 ft. gravel roads in Vincennes and Johnson twps.; 1,457 ft. in Busseron twp.; 1,490 ft. in Johnson twp.; 7,962 ft. in Vigo twp.; 4,471 ft. in Busseron twp.	John T. Scott, County Auditor.
Indiana	Marion	Sept. 5	Constructing 8 roads in Grant County.	County Commissioners.
New Jersey	Westfield	Sept. 5, 8 p.m.	Constr. 9,500 sq. yds. macadam; 2,316 lin. ft. concrete curb and gutter.	Charles Clark, Town Clerk.
Kentucky	Paducah	Sept. 5, 10 a.m.	Constr. sidewalks, curbing and drainage.	L. A. Washington, City Engr.
Connecticut	Waterbury	Sept. 5, 8 p.m.	Grading Idylwood avenue.	R. L. Cairns, City Engineer.
New Jersey	Totowa	Sept. 5, 8 p.m.	Grading and constructing concrete curbs and sidewalks.	W. R. Hudson, Mayor.
Pennsylvania	Sharpville	Sept. 5, 6 p.m.	Constructing 20,000 sq. yds. Tarvia Modern pavement.	W. A. Graber, Boro. Secretary.
California	Santa Barbara	Sept. 5	Improving 11 miles of road.	C. A. Hunt, County Clerk.
Indiana	Washington	Sept. 5	Constructing 2½ miles gravel roads.	Thomas Nugent, County Auditor.
Indiana	Columbus	Sept. 5	Constructing 2 stone roads.	P. J. Sater, County Auditor.
Indiana	Leavenworth	Sept. 5	Constr. 23,000 lin. ft. pipe road cost \$9,400.	J. E. Jones, County Auditor.
Indiana	Rockville	Sept. 5	Constr. gravel roads.	J. E. Elder, County Auditor.
Pennsylvania	North Braddock	Sept. 5	Improving 4 streets.	C. A. Stewart, Boro. Engineer.
Ohio	Columbus	Sept. 6	Paving with brick, curbing and laying water service pipes.	H. F. Holton, Dir. Pub. Service.
Idaho	Lewiston	Sept. 6	Hard surfacing 19,000 sq. yds. pavement.	C. F. Leland, City Clerk.
Indiana	Monticello	Sept. 6	Grading, draining and paving roads with stone.	A. G. Fisher, County Auditor.
Indiana	Brazil	Sept. 6, 11:30 a.m.	Improving 2,022 ft. gravel road.	Edgar A. Staggs, County Auditor.
Ohio	Lakewood	Sept. 6, noon	Improving 4 streets.	B. M. Cook, City Clerk.
Ohio	Dayton	Sept. 6, noon	Paving with brick, sheet asphalt, bituminous macadam or creosoted wood blocks and setting curbing.	J. C. Ely, Dir. Pub. Service.
Ohio	Waverly	Sept. 6, 1 p.m.	Macadamizing and constr. with conc. 1 mi. road, cost \$6,900.	County Commissioners.
Ohio	Millersburg	Sept. 6, 1 p.m.	Macadamizing 1.4 miles road, cost \$9,900.	County Commissioners.
Kansas	Ottawa	Sept. 6, 7:30 p.m.	Constructing 1,000 sq. yds. concrete pavement.	W. T. Wood, Mayor.
New Jersey	Camden	Sept. 7, 10:30 a.m.	Constr. 8,000 cu. yds. gravel in roads; 1,000 ft. underdrain; 12,200 cu. yds. excavation; 533 sq. yds. brick gutters.	John Prentice, Director.
Tennessee	Johnson City	Sept. 7, 7 p.m.	Constr. brick, asphalt, bitulithic, wood block, granitoid pavement with curb gutter, etc.	P. F. McDonald, City Comr.
California	Santa Barbara	Sept. 7	Improving 3 streets; paving concrete curbs and gutters.	Alfred Davis, City Clerk.
New York	Huntington	Sept. 8, 11 a.m.	Improving Main street.	A. P. Whitson, Superintendent Hwys.
Ohio	Ashland	Sept. 8, 1 p.m.	Macadamizing 1.6 miles road, cost \$9,500 also macadamizing 1 mile of road, cost \$6,300.	County Commissioners.
Indiana	Crown Point	Sept. 8	Constructing 4 gravel roads.	C. A. Johnson, County Auditor.
Dist. of Col.	Washington	Sept. 8, 2 p.m.	Laying asphalt block pavement.	B. R. Green, Superintendent Lib. Con.
Ohio	Mansfield	Sept. 9, 10 a.m.	Constructing 3.37 miles macadam, cost \$24,648.	County Commissioners.
Ohio	Sandusky	Sept. 11, 1 p.m.	Macadamizing 1.11 miles road, cost \$4,37.	County Commissioners.
Pennsylvania	New Castle	Sept. 12, noon	Constr. 2 miles turnpike with bituminous top surface.	F. A. Price, County Hwy. Com.
New Jersey	Bogota	Sept. 12, 8 p.m.	Constructing 2,650 sq. yds. 4-in. macadam.	W. N. Smith, Mayor.
Arkansas	Little Rock	Sept. 12, 2 p.m.	Constructing 29 blocks asphalt pavement.	County Commissioners.
Ohio	Marietta	Sept. 13, 1 p.m.	Paving with brick 1.21 miles road, cost \$14,729; also 1.57 miles concrete or brick, cost \$13,317 or \$19,102.	County Commissioners.
Ohio	Columbus	Sept. 15	Macadamizing 1 mile road.	County Commissioners.
Indiana	Greenfield	Sept. 15, 2 p.m.	Improving highway.	Charles H. Troy, County Auditor.
Illinois	Broadlands	Sept. 15	Constr. ½ mile vitrified brick paving with stone curb.	A. M. Kenney, Chm. Bd. Loc. Imp.
Ohio	Cincinnati	Sept. 22, noon	Improving road.	Stanley Struble, Pres. Co. Comrs.
Illinois	Catlin	Sept. 29	Constr. vitrified brick pavement, cost \$35,000.	Dr. O. Allison, Chm. Bd. Loc. Imp.
SEWERAGE				
New York	Buffalo	Sept. 1, 11 a.m.	Constructing sewers in several streets.	F. G. Ward, Commissioner Pub. Wks.
Iowa	Eagle Grove	Sept. 3	Constr. 600 ft. 10-in. sewer.	S. A. Middleton, City Clerk.
South Dakota	Mitchell	Sept. 4, 8 p.m.	Constructing lateral sewers.	N. H. Jensen, City Auditor.
New York	Newburgh	Sept. 5, 5 p.m.	Constructing 1,400 lin. ft. clay pipe sewer.	B. J. Coutant, City Clerk.
Mississippi	Clarksdale	Sept. 5	Extending and improving sewer system, water works and electric lighting, cost \$55,000.	W. S. Bowles, City Engineer.
Ohio	Toledo	Sept. 5, noon	Constructing sewers.	Fred Shane, Secy. to Dir. Pub. Serv.
New Jersey	Westfield	Sept. 5, 8 p.m.	Constructing 2,750 lin. ft. 8-in. sewers.	Charles Clark, Town Clerk.
New York	Newburgh	Sept. 5	Constructing 1,400 ft. clay pipe sewer.	City Clerk.
Kansas	Wichita	Sept. 5	Constr. 38,950 lin. ft. 30 to 48-in. brick or concrete sewer; also 3,950 lin. ft. 12 to 18-in. clay pipe sewer and appurtenances.	B. C. Wells, City Engineer.
Indiana	Galveston	Sept. 6	Constructing 2 sewers.	Eugene Masters, City Clerk.
Ontario, Can.	Hamilton	Sept. 6	Constr. sewers on several streets.	G. H. Lees, Chm. Board Control.
Maryland	Baltimore	Sept. 6, 11 a.m.	Constr. lateral sewers, section 4 high level interceptor and storm water drains.	Charles England, Chm. Bd. Awards.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO.
SEWERAGE (Continued)				
Arkansas.....	Prescott.....	Sept. 6, 1:30 p.m.....	Excavating 25,500 cu. yds. laying 49,000 lin. ft. sewer pipe and bldg. 120 manholes and a sewer treating plant.....	M. W. Greeson, Secy. Bd. Comrs.
Massachusetts.....	New Bedford.....	Sept. 6.....	Constr. 3,300 ft. cast iron pipe out-fall sewer.....	W. M. Williams, City Engineer.
Connecticut.....	Ansonia.....	Sept. 7.....	Constructing sewer system.....	V. B. Clarke, City Engineer.
Illinois.....	Bushnell.....	Sept. 7.....	Constr. about 5 blocks of sewers.....	City Clerk.
Louisiana.....	New Orleans.....	Sept. 11, noon.....	Constr. Napoleon ave. system of drainage canals.....	F. S. Shields, Secy. Water Bd.
Louisiana.....	Lake Charles.....	Sept. 11.....	Constr. 22 miles 6 to 24-in. clay pipe sewers, pumping station and motor driven centrifugal pumps and 4 reinforced concrete reduction tanks.....	A. A. Wentz, Secretary. W. G. Kirkpatrick, Engr., Jackson Mich.
Louisiana.....	New Orleans.....	Sept. 11, noon.....	Constr. Napoleon ave. system; drainage canals and pipe lines; 53,000 cu. yds. reinforced concrete and 75,000 ft. 6-to 36-in. clay pipe.....	Leon Manberret, Clerk.
Kansas.....	Columbus.....	Sept. 11, noon.....	Constr. 15 miles sanitary vitrified pipe sewer 8 to 15-in. with manholes, flush tanks, etc.....	F. H. Hawkins, City Clerk.
Louisiana.....	New Orleans.....	Sept. 11, noon.....	Constr. system drainage canals and pipe lines.....	F. S. Shields, Secy. Sewerage Bd.
Iowa.....	Belle Plaine.....	Sept. 11.....	Constr. 11½ miles 8 to 18 in. sanitary sewers.....	S. J. Ferree, City Clerk.
Kansas.....	Columbus.....	Sept. 11.....	Constr. 15 miles 8 to 15-in. clay pipe sewer and disposal work.....	F. H. Hawkins, City Clerk.
Ontario, Can.....	Toronto.....	Sept. 12.....	Constr. storm water sewers and high level interceptor.....	G. R. Geary, Chm. Bd. Control.
South Carolina.....	Rock Hill.....	Sept. 15.....	Constructing 3 sewerage disposal plants.....	Commissioners Sewerage.
Illinois.....	Bushnell.....	Sept. 30, 7:30 p.m.....	Constructing 5 blocks of sewers.....	C. L. Harrah, City Clerk.
Virginia.....	Colonial Beach.....	Oct. 11, noon.....	Constr. 3 miles 8 to 15-in. sewers, 3 miles 4 to 8-in. water mains, sewage disposal plant, sewage lifts, power house, water tower and artesian well.....	H. W. B. Williams, Mayor.
WATER SUPPLY				
Iowa.....	Osage.....	Sept. 1.....	Drilling and casing deep well.....	A. S. Wright, City Clerk.
South Carolina.....	Honea Path.....	Sept. 1.....	Constr. water works and electric light plant, cost \$37,000.....	John F. Monroe, Chm. Bd. Pub. Wks.
Tennessee.....	Cleveland.....	Sept. 1, 2 p.m.....	Constr. reinforced concrete reservoir 190x150 ft. with division through the center.....	G. T. Hall, Chm. Water Com.
North Carolina.....	Newbern.....	Sept. 1.....	Furnishing 1,500 ft. 6-in. c. i. pipe.....	T. F. Patterson, Clerk.
Nebraska.....	Crawford.....	Sept. 2, 4 p.m.....	Constructing 3,400 ft. wood stave water pipe and 2,000 lbs. cast iron fittings.....	Clyde Hornby, City Clerk.
Wisconsin.....	Sparta.....	Sept. 2, 2 p.m.....	Constr. 4,600 lin. ft. 4 to 10-in. water pipe and 5 hydrants.....	C. H. Gregory, Secy. Water Com.
Pennsylvania.....	Homestead.....	Sept. 4.....	Constr. 630 ft. 6-in. c. i. pipe and appurtenances.....	F. Trautland, Boro. Clerk.
Montana.....	Manhattan.....	Sept. 4.....	Constr. gravity system water works.....	R. H. Dean, Town Clerk.
California.....	Fresno.....	Sept. 4, 2 p.m.....	Constructing steel water tank tower.....	D. M. Barnwell, Clerk. Board Super.
Virginia.....	Norfolk.....	Sept. 4, 8 p.m.....	Constructing additions to water supply.....	Water Commission.
California.....	Dorris.....	Sept. 4.....	Constr. water works; pump with gasoline or electric power.....	Fred Chapman, Town Clerk.
Wisconsin.....	Windsor.....	Sept. 5.....	Constructing intake in bed of river; cost \$30,000.....	City Clerk.
Kansas.....	Burden.....	Sept. 5.....	Constr. water works; cost \$18,000.....	J. D. Crawford, City Clerk.
Iowa.....	Inwood.....	Sept. 5.....	Constructing water works.....	Hugo Reimers, City Clerk.
Mississippi.....	Clarksdale.....	Sept. 5, 8 p.m.....	Furnishing 53,700 ft. 4 to 8-in. c. i. pipe with hydrants, valves etc. sinking well; installing pumps and air compressor.....	M. W. Purnell, City Clerk.
Texas.....	Fort Worth.....	Sept. 5.....	Constr. dam containing about 300,000 cu. yds. earth work and 60,000 cu. yds. masonry; also 6½ miles pipe line.....	Board Engineers, City Hall.
Canada.....	Winnipeg, Man.....	Sept. 5, 11 a.m.....	Supplying a quantity of cast iron water pipe.....	M. Peterson, Sec'y Bd. Control.
Texas.....	Fort Worth.....	Sept. 5.....	Constr. dam containing 300,000 cub. yds. earth and 60,000 cu. yds. masonry; also 6½ miles concrete pipe.....	W. J. Estes, City Secretary.
Minnesota.....	Rush City.....	Sept. 5, 6 p.m.....	Furnishing and installing water mains, hydrants, electric fire pump and motor.....	J. F. Sommers, Village Recorder.
Michigan.....	Muskegon.....	Sept. 5.....	Constructing water works improvements.....	City Clerk.
Wisconsin.....	Milwaukee.....	Sept. 5.....	Furn. and laying 5,000 lin. ft. 8-in. c. i. water pipe and appur.	S. Brew, Village Clerk.
Nebraska.....	Omaha.....	Sept. 6.....	Constr. 14 in. water main, cost \$8,000.....	Water Board.
Iowa.....	Decorah.....	Sept. 6.....	Constructing water mains.....	F. M. Hughes, City Clerk.
Nebraska.....	Omaha.....	Sept. 6.....	Constr. 14-in. water main; cost \$8,000.....	Water Board.
California.....	Sawtelle.....	Sept. 7.....	Installing water softening plant at Soldiers Home.....	E. W. Moore, Treasurer.
Iowa.....	Council Bluffs.....	Sept. 7.....	Furn. two 100-h. p. motors and constr. concrete reservoir.....	Water Works Commissioners.
Minnesota.....	Minneapolis.....	Sept. 8.....	Furnishing filter equipment and devices.....	H. N. Knott, City Clerk.
North Dakota.....	Dunseith.....	Sept. 11.....	Constructing water works for sanitarium.....	D. Lemieux, Secretary.
South Dakota.....	Vermillion.....	Sept. 11.....	Constructing steel tower and tank.....	G. J. Kempker, Mayor.
Iowa.....	Belle Plaine.....	Sept. 11.....	Constructing 6 miles 4 to 8-in. water mains.....	S. J. Ferree, City Clerk.
South Dakota.....	Henry.....	Sept. 12.....	Constructing water works.....	Edw. Gunther, Mayor.
South Dakota.....	Sioux Falls.....	Sept. 15.....	Sinking well, cost \$12,000.....	S. B. Howe, City Engineer.
North Dakota.....	Grand Forks.....	Sept. 15.....	Furn. vert. comp. steam pump 1½ million gals. capacity.....	H. G. Lykken, City Engr.
Illinois.....	Canton.....	Sept. 16.....	Furn. and erecting 20,000,000 gal. pumping engine also air compressor.....	C. R. Bean, City Engineer.
Ohio.....	Springfield.....	Sept. 18.....	Furnishing pumping machinery; cost \$18,000.....	Director Public Service.
Iowa.....	Fairfield.....	Sept. 25, 7 p.m.....	Constr. filter tanks, coagulating tanks, settling tank pumps, blower, washing devices, pipe fittings, etc., capacity 1,000,000 gals. per day.....	C. E. Ward, Chm. Water Com.
Ohio.....	Toledo.....	Sept. 29, noon.....	Constructing reservoir 15,000,000 gal. capacity.....	J. R. Cowell, Dir. Pub. Service.
Canada.....	Montreal, Que.....	Oct. 3, noon.....	Constr. prefilter, filtered water reservoir and appurtenances.....	Board Commissioners.
Australia.....	Queensl'd, Brisb.....	Jan. 30, noon.....	Furnishing a 6 million gallon pumping plant of 2 or 3 units.....	G. E. Johnston, Secy. Board, Albert St., Brisbane, Queensland.
BRIDGES				
Pennsylvania.....	Renovo.....	Sept. 1.....	Constructing steel superstructure of 3-span bridge.....	D. I. McNaul, County Clerk.
Texas.....	Lamarque.....	Sept. 1, 4 p.m.....	Constr. 25 to 40 small timber bridges.....	B. F. Ayers, Chm. Bd. Comrs.
Ohio.....	Youngstown.....	Sept. 2, 11 a.m.....	Constructing steel bridge 255 ft. long.....	W. B. Jones, County Auditor.
Illinois.....	New Athens.....	Sept. 2, 10 a.m.....	Constr. reinforced concrete bridge.....	E. M. Fullmer, Town Clerk.
Illinois.....	New Athens.....	Sept. 2, 10 a.m.....	Constructing reinforced concrete bridge.....	County Supervisors.
Illinois.....	Harvard.....	Sept. 4, 8 p.m.....	Constr. 3 reinforced concrete highway bridges.....	P. E. Saunders, City Clerk.
Mississippi.....	Wanilla.....	Sept. 4.....	Constructing steel bridge.....	W. H. Speights, Co. Clk.
California.....	Colusa.....	Sept. 5, 3 p.m.....	Constructing 3-span concrete bridge.....	County Supervisors.
California.....	San Jose.....	Sept. 5.....	Constructing reinforced concrete bridge.....	Board Supervisors.
New York.....	New York.....	Sept. 5, 11 a.m.....	Constr. 2 reinf. conc. arch bridges; span 67 ft. and 200 ft.....	Charles Strauss, Pres. Bd. Sup. Wat.
California.....	San Jose.....	Sept. 5.....	Constr. a concrete bridge and culvert.....	County Supervisors.
New York.....	New York.....	Sept. 5, 11 a.m.....	Constr. 2 reinforced concrete bridges with spans 67 ft. and 200 ft.; also 4 bridges having spans of 25 ft. and 39 ft. with their approaches.....	Bd. Wat. Sup., 165 B'way., N. Y.
Pennsylvania.....	Reading.....	Sept. 4.....	Constructing Penn Street bridge.....	County Commissioners.
Florida.....	Tampa.....	Sept. 6, 2 p.m.....	Constr. reinforced concrete or concrete steel bridge with bascule lift.....	D. B. McKay, Chairman.
Ohio.....	Summit.....	Sept. 6, 11 a.m.....	Erection and constr. of substructure and superstructure of bridge over Wolf Creek.....	Bd. County Commissioners.
California.....	Salina.....	Sept. 6, 2 p.m.....	Constr. bridge and jetty work; cost \$38,000.....	T. P. Joy, County Clerk.
North Carolina.....	Wentworth.....	Sept. 6.....	Constructing several bridges.....	J. P. McMichael, County Clerk.
Indiana.....	LaPorte.....	Sept. 7.....	Constr. iron bridge and concrete arch cluvert.....	F. A. Hausher, Co. Auditor.
California.....	Visalia.....	Sept. 8.....	Constructing bridge.....	Board Supervisors.
Ohio.....	Cincinnati.....	Sept. 8, noon.....	Constr. culverts, bridges and retaining walls.....	Fred Drehs, Clerk.
South Dakota.....	Sioux Falls.....	Sept. 8, 2 p.m.....	Constructing concrete bridge.....	County Auditor.
South Dakota.....	Sioux Falls.....	Sept. 8, 2 p.m.....	Constr. concrete bridge across river.....	Henry Howe, County Auditor.
Ohio.....	Massillon.....	Sept. 8, noon.....	Planning West St. River Bridge.....	W. A. Pietzcker, Director.
Illinois.....	Quincy.....	Sept. 9, 2 p.m.....	Constructing steel bridge in Mellrose.....	Joseph Schonarth, Town Clerk.
Ohio.....	Warren.....	Sept. 11, 1 p.m.....	Constructing steel bridge 38½ ft. span.....	W. R. Harrington, Clk. Co. Comrs.
New York.....	White Plains.....	Sept. 11, 10 a.m.....	Widening masonry bridge at Port Chester.....	Board Supervisors.
Texas.....	Angleton.....	Sept. 11, noon.....	Building 2 bridges over Brazos river.....	J. W. Munson, County Judge.
Kansas.....	Kansas City.....	Sept. 11, 10 a.m.....	Reconstructing James St. Bridge.....	F. M. Holcomb, County Clerk.
Pennsylvania.....	York.....	Sept. 11, 10 a.m.....	Constructing reinforced concrete bridge.....	County Commissioners.
Ohio.....	Lancaster.....	Sept. 11.....	Constr. steel superstructures of 2 bridges.....	H. C. Delt, County Clerk.
Idaho.....	Pocatello.....	Sept. 12.....	Constr. steel bridge over Bear River.....	Bd. County Commissioners.
Ohio.....	Cleveland.....	Sept. 20, 11 a.m.....	Constructing miscellaneous bridge work.....	J. F. Goldenbogen, Co. Clk.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER				
South Carolina	Honea Path	Sept. 1	Constr. electric light plant and water works system; cost \$37,000	J. F. Monroe Chm. Bd. Pub. Wks.
Florida	Jacksonville	Sept. 4, 3 p.m.	Furnishing and erecting a complete switchboard in new power station	W. M. Bostwick, Jr., Chm. Bd. Trus.
Mississippi	Clarksdale	Sept. 5	Improving lighting system	W. S. Bowles, City Engineer.
North Dakota	Fargo	Sept. 5	Constructing electric light plant	E. R. Orchard, City Auditor.
South Dakota	Brookings	Sept. 6	Furnishing metal and composition lighting fixtures for Court House	O. J. Otterness, County Auditor.
Iowa	Council Bluffs	Sept. 7, 3 p.m.	Furnishing 2 100-h. p. motors	J. C. Jensen, Chm. Wat. Wks. Trus.
Minnesota	St. Paul	Sept. 7	Furn. 4,100 gas lamp heads; 1,400 gasoline lamp heads and 1,400 posts	Oscar Claussen, Comr. Pub. Wks.
Australia	Brisbane	Jan. 30, noon	Designs, supply and erection at Mount Crosby Pumping Station of alternatively one, two and three complete units consisting of power generating pumps and plants, etc.	Geo. Johnston, Albert St., S.&W.Bd
MISCELLANEOUS				
Texas	Lamarque	Sept. 1	Constr. ditches and laterals requiring 210,000 cu. yds. excav.	B. F. Ayers, Chm. Bd. Comrs.
Oregon	Portland	Sept. 1, 4 p.m.	Furn. 5,000 lin. ft. iron fence and 54 iron posts	D. D. Clark, Engr. Water Board.
Pennsylvania	Williamsport	Sept. 1, noon	Furnishing 1,000 ft. 2½-in. fire hose	J. J. Galbraith, City Clerk.
Georgia	Augusta	Sept. 5	Constructing city stables	Commissioner Pub. Wks.
Virginia	Richmond	Sept. 5, noon	Certain dredging along left shore James River	City Engineer.
Connecticut	Waterbury	Sept. 5, 8 p.m.	Constructing concrete retaining wall	R. A. Cairns, City Engineer.
New York	New York	Sept. 5	Install. extension of underground fire alarm telegraph system	Jos. Johnson, Fire Commissioner.
Pennsylvania	Carrick	Sept. 6	Constr. Municipal Building for Baldwin township	R. Berg, Jr., Archt. 304 Phillips ave
Ohio	Cincinnati	Sept. 6, noon	Furnishing 100 tons refined asphalt	J. J. Wenner, City Clerk.
Ohio	Cleveland	Sept. 7, noon	Furnishing and delivering on City Hall Site all structural steel and iron for building new City Hall	A. B. Lea, Dir. Pub. Service.
Iowa	Council Bluffs	Sept. 7, 3 p.m.	Furnishing 5,000 bbls. Portland cement	Water Works Trustees.
Ohio	E. Cleveland	Sept. 8, noon	Installing complete combination Police and Fire Signal system for city	Kline F. Leet, City Clerk.
Palestine	Jerusalem	Sept. 13	Constr. and operating water works, electric light and tramway concessions	No. 7052 Bur. M'f'ers, Wash. D.C.
Ohio	Lima	Sept. 15, noon	Furn. 8-200 h. p. boilers, 6 engines, 6 gen., switchboard, etc.	G. E. Whitney, Secretary.
Ohio	Springfield	Sept. 18	Supplying new engine for Municipal Water Works	City Clerk.
New York	Mattewan	Sept. 19, 8 p.m.	Constructing fire house	H. P. Johnston, President.

STREET IMPROVEMENTS

Anniston, Ala.—Board of County Commissioners will spend \$4,000 on Alexandria rd. to make it State highway.

Gadsden, Ala.—Ordinance has been passed providing for paving, grading, curbing and otherwise improving sidewalks on east side of First st. from south line of Broad st. to north curb line of Chestnut st.

Guin, Ala.—County Commissioners have decided to complete Hamilton-to-Guin State highway, a distance of about 16 miles.

Huntsville, Ala.—Ordinance has been passed by City Commissioners providing for paving of Eustis st. with macadam and tarvia.

Little Rock, Ark.—Bonds amounting to \$125,000 will soon be sold for purpose of making good roads.

Los Angeles, Cal.—Board of Public Works has decided to renew driveway of Aliso st. bridge with creosoted wood blocks at cost of \$1,750.

Redondo Beach, Cal.—Petition is being considered for paving Pacific ave. and Esplanade.

San Francisco, Cal.—Finance Committee of Board of Supervisors has approved request of Board of Public Works for appropriation of \$240,000 for street and sewer work.

San Francisco, Cal.—Petition has been made asking Board of Supervisors to open 21st st. between Rhode Island and Wisconsin sts.

Hartford, Conn.—Commissioners have authorized macadamizing of Wells ave.

Middletown, Conn.—Street Committee of Common Council is advertising for bids for construction of 1,400 ft. of concrete sidewalks on Washington Green.

Pueblo, Colo.—Extension of Grand ave. to Main st. has been authorized by City Council.

Wilmington, Del.—Bids will be received until noon, Aug. 29, by Daniel Thompson, Chairman Finance Committee, for purchase of \$95,000 4 per cent coupon highway improvement bonds.

Washington, D. C.—Extensive improvements will be made to roads and driveways in and about Rock Creek Park.

Kissimmee, Fla.—Broadway, main street of Kissimmee, will be paved with vitrified brick.

Pensacola, Fla.—Specifications of paving work in city have been completed, and trustees will shortly call for bids.

West Tampa, Fla.—Voters have authorized \$100,000 bond issue for public improvements.

Richmond, Ga.—At meeting of Georgia-Alabama Good Roads Association movement looking to construction of improved highway from Atlanta to gulf was launched. Meeting was attended by 7,000 persons representing States of Georgia, Alabama and Florida and highway project met with enthusiastic approval.

Rome, Ga.—Council and Board of Public Works have decided to pave North Broad st. with driveway of wood blocks 60 ft. wide.

Belleville, Ill.—Ordinance has been passed providing for paving of Ogle st. with wood blocks.

Champaign, Ill.—Plans are being prepared for vitrified brick paving in alley from Neil to Elm st., and in Lynn st., from Green to Washington sts.; estimated cost, \$6,300 and \$22,600.

Freeport, Ill.—City is considering paving of Taylor ave. from C. M. and St. P. tracks to park.

E. St. Louis, Ill.—Ordinance will be introduced for paving of Edgemont thoroughfare at cost of \$227,000.

Peoria, Ill.—Petition has been received by Board of Local Improvements requesting paving of North st. for about ¼ of mile.

Quincy, Ill.—Resolution has been adopted for paving of 12th st. from Maine to Broadway and Kohn alley.

Quincy, Ill.—Board of Public Works has authorized resurfacing of 24th st. from Locust to Broadway.

Chesterton, Ind.—Plans are under way for one of greatest boulevards in West, which will connect Chesterton, Porter, Miller, Gary, East Chicago and Hammond in broad macadam driveway 20 miles long.

New Castle, Ind.—Petition is being considered asking for extension of Central ave. across L. E. & W. tracks to Sixteenth st.

Des Moines, Ia.—Resolutions asking for paving of several streets and other changes have been adopted at meeting of East Des Moines Commercial League. They ask City Council to pave E. 13th st. north from Grand ave.; Walker st. between E. 12th and E. 18th sts.; and Pennsylvania ave. between Jefferson and Walker sts.

Boston, Mass.—Council has voted to transfer \$175,000 from reserve fund to Street Commissioners for extension of Arlington st. from Beacon st. to Charles River esplanade.

Saginaw, Mich.—Board of Commerce of Flint has resolved that proposed macadam road connecting Flint and Saginaw should be built.

Fulton, Mo.—Mass meeting will be held for discussing nine miles of central highway in Fulton Special Road District.

St. Joseph, Mo.—Ordinances have been passed for improving Jules st. from west line of 26th st. to west line of 27th st., also for improving North and South alley between 24th and 25th sts.

St. Joseph, Mo.—Plans are being considered for boulevard to begin at Ashland ave. and Osage st., thence extend south along 28th st. to Burlington's right-of-way, thence take an easterly direction to 31st st., and after that extend south to Bartlett park.

Billings, Mont.—Citizens are asking for paving of alleys, and resolution has been passed providing for improvements in two blocks north of Montana ave. between 27th and 29th sts.

Collingswood, N. J.—Borough Council has ordered special election held Sept. 23 for voting on \$50,000 bond issue for street improvements.

Newark, N. J.—Ordinances have been passed providing for paving and improving of various streets.

Plainfield, N. J.—Street improvement bonds of \$34,000 value have been awarded to Plainfield Trust Co.

Roselle Park, N. J.—Citizens are discussing bond issue for street improvements as follows: Westfield ave., Chestnut st., Fairoute ave. and Grant ave., also Locust pl., Locust st., from Westfield ave. to Lehigh Valley Railroad; Filbert st. from Westfield ave. to Grant ave.; Chestnut st. from Westfield ave. to Roselle ave.; Walnut st., from Grant ave. to Roselle ave.; Clay ave., from Walnut to Locust st.; Chester ave., between Chestnut and Walnut sts.; Grant ave., from Fairoute ave. to Galloping Hill rd.

Westfield, N. J.—Ordinance has been passed providing for macadamizing of Edgewood ave. between Clark st. and Park pl.

Roswell, N. M.—Improvements to various streets are contemplated.

Brooklyn, N. Y.—Following streets will be paved as follows: Metropolitan ave., granite block, \$40,000; Jackson ave., granite block, \$30,000; Broadway, Flushing, granite block, \$120,000; with amecite pavement, College Point causeway, \$75,000; Cooper ave., \$6,000; Woodhaven ave., \$7,500; Hempstead and Jamaica turnpike, \$90,000; Merrick rd., \$20,000; Central ave., Far Rockaway, \$35,000; Hempstead and Jamaica turnpike to city line, \$50,000; Astoria and Flushing rd., \$35,000; Shell rd., \$35,000.

Newburgh, N. Y.—Resolution has been passed authorizing issue of \$25,000 improvement bonds for paving and improving Colden and Water sts.

Rochester, N. Y.—Ordinances have been passed providing for Clarkson st. asphalt pavement, \$2,600, and Jay st. medina stone pavement, \$25,000.

Rochester, N. Y.—Ave. D will be paved with asphalt.

Akron, O.—Ordinances have been passed providing for paving of various streets.

Barberton, O.—Ordinance has been passed for paving of portion of Cornell st.

Cincinnati, O.—Council is considering improving Rochelle st., from Eden ave. to Vaughn ave.; paving with granite South st., from Gest to Kelso st.; paving with granite, South st., from Evans st. to C. H. & D.; improving Principio ave., from Herschell ave. to Heekin ave., and Heekin ave., from Principio ave. to a point 400 ft. north of Garretson ave. Purpose of this proposed improvement is to furnish entrance to Ault park.

Newburgh, O.—Bids will be received until 12 M, Sept. 12, by R. A. Wood, Auditor, for purchase of following street improvement bonds: First issue, \$3,400; second issue, \$3,433; third issue, \$4,308; fourth issue, \$4,308; fifth issue, \$6,650.

Portland, Ore.—Plans for opening Sandy rd. from terminus at East 16th st. west through two blocks to connect with East Burnside st. at East 13th are being formulated by Rose City Park Improvement League.

Canonsburg, Pa.—Supervisors of Cecil Township are again advertising for bids for construction of three 1/4-mile sections of brick road.

Erie, Pa.—Ordinances have been passed providing for grading, curbing and paving of Liberty st., from Brown's ave. to 26th st.; Plum st., from Eighth st. to Park ave.; 14th st., between German and Parade sts.; also for laying cement sidewalks on both sides of Pennsylvania ave., between 23d and 26th sts.

Erie, Pa.—Ordinances have been passed providing for grading, curbing and paving of Liberty and Plum sts.

Harrisburg, Pa.—Ordinance has been passed providing for paving and curbing of Holly st. from 17th to 18th sts.

Lebanon, Pa.—City is contemplating various street improvements.

McKeesport, Pa.—Ordinances have been passed authorizing grading, curbing and paving South Evans ave. from Jenny Lind st. to River st.; Bard st. from Wylie ave. to May st.; Lincoln alley from Shaw ave. to 6th st.

Millersburg, Pa.—On Aug. 26 special election will be held for purpose of voting upon question of increasing its bonded indebtedness \$6,000 for paving of Centre and North sts.

Reading, Pa.—Ordinance has been passed providing for paving Court st. from 2d to 4th sts. with vitrified block.

Scranton, Pa.—Ordinance has passed authorizing grading, paving and curbing of Hitchcock Court, from Mulberry st. to Vine st., in the 17th Ward.

Scranton, Pa.—Numerous ordinances have been passed providing for improvements on various streets.

Shamokin, Pa.—Ordinance has been passed providing for paving and curbing of that portion of Clay st., from western side of Rock st., eastwardly to western side of Shamokin st.

Columbia, S. C.—Bids are now being asked on work of paving Main st.

Sioux Falls, S. D.—Resolutions have been passed for grading 5th ave. from 13th st. to 14th, and for constructing cement concrete sidewalks on 16th st.

Asheville, Tenn.—Commissioners have authorized extension of North Buncombe rd., also Swannanoa rd.

Knoxville, Tenn.—Bids are being received for macadamizing of four streets.

Abilene, Tex.—City Commission has advertised for bids for paving of Texas & Pacific railway crossing on Pine st. Crossing for width of 100 ft. will be macadamized and treated with asphalt.

Childress, Tex.—Appropriation has been made of \$1,200 for improvement of public road between this city and Red River.

Childress, Tex.—Election will be held for voting on \$50,000 bond issue for road improvements in Commissioners' Precinct I.

Coleman, Tex.—Citizens have voted for \$25,000 bond issue for improvement of streets.

Graham, Tex.—Election will be held Sept. 23 for voting on issuance of \$100,000 for purpose of constructing and maintaining macadamized, graveled or paved roads in Young County.

San Antonio, Tex.—County Commissioners are considering construction of highway in San Patricio County to be brick in highway to the coast.

Temple, Tex.—Paving of road between this city and Belton is being considered.

Logan, Utah.—Council will spend \$17,000 on sidewalk construction.

Salt Lake City, Utah.—Paving of Fifth East st. from Third South st. to Liberty Park at 9th st. is contemplated.

Portsmouth, Va.—Specifications are being prepared for street improvement program to cost about \$40,000.

Seattle, Wash.—Ordinances have been passed authorizing issuance of bonds for grading, etc., of various streets.

Wheeling, W. Va.—Plans for improvement of Top Mill rd. will be considered.

CONTRACTS AWARDED

Lodi, Cal.—By City Trustees, for paving six blocks of business section, to Ransome-Crummey Co., of San Francisco.

Oakland, Cal.—By Board of Supervisors, for macadamizing portion of Altamont rd., to P. H. Hoace, at \$21,990.

Bridgeport, Conn.—By County Commissioners, for rebuilding of High Ridge pike, to Rosser, Maloney & Hammond, at \$22,433.33.

Jacksonville, Fla.—By County Commissioners, for paving Pensacola rd., to Logan Concrete and Engineering Co., at: 2 miles of work, at \$700 per mile; 3 miles, at \$850; 6 miles, at \$975, and remaining 6 miles, at

\$1,400 per mile, making a total of \$18,200 for entire construction, or an average of \$1,070 a mile.

Chicago, Ill.—By City, for paving Wash ave. with asphalt, to American Asphalt Pavement Co., at \$101,552.65.

Chicago, Ill.—By city for paving Randolph and Clark sts., to William Kissack, at \$3.93 per sq. yd.

Chicago, Ill.—By City, for paving of Vincennes rd. with brick, to Calumet Coal & Teaming Co., at \$102,675.20.

Chicago, Ill.—By City, for paving streets as follows: Dearborn—Jackson boulv. to Van Buren st., creosote; American Asphalt Paving Co., \$6,183. Belmont—Evanston ave. to 187 ft. east, granite macadam; Central Paving Co., \$627.50. Belle Plaine—North Ashland ave. to East Ravenswood Park, asphalt; American Asphalt Pavement Co., \$7,801.50. Devon—Evanston ave. to North Clark st., brick; \$19,322.50. West 51st st.—South Halsted to Wood st., granite block; Ready & Callaghan Coal Co., \$6,999.40. West Harrison—South Kedzie to South 40th ave., brick; Standard Paving Co., \$36,025. Lincoln ave.—North Western to North Berwyn ave., granite block; the Ryan Co., \$43,851.90. West Madison, North and South 48th aves. to North and South Austin aves., brick; Standard Paving Co., \$85,310. Marianna—Lincoln to Southport ave., asphalt; American Asphalt Paving Co., \$14,700.50. Marquette—East 76th to East 79th st., asphalt; American Asphalt Paving Co., \$13,976.20. North Mozart—West Chicago ave. to West Division st., asphalt; R. F. Conway Co., \$18,713. Prairie—East 47th to East 51st st., asphalt; R. F. Conway Co., \$18,604.90. Soult—Welling st. to King pl., asphalt; American Asphalt Pavement Co., \$2,329.20. St. Lawrence—East 47th to East 51st st., asphalt; American Asphalt Paving Co., \$21,787.70. West 12th—South 40th to South 43d ave., brick; Standard Paving Co., \$15,445. North Washenaw—West Lake st. to 380 ft. north of Fulton st.; Standard Paving Co., \$7,922.30.

Springfield, Ill.—By City, for paving South Grand ave., to Capital City Construction Co., at \$29,568.70. Other bids as follows: Illinois Construction Co., Walnut st. to Park ave., \$17,591.70; Park ave. to country road, \$12,670; total, \$30,261.70; John E. Bretz, Walnut st. to Park ave., \$17,946.20; Park ave. to country road, \$12,980; total, \$30,926.20; Wm. Kissack, Walnut st. to Park ave., \$18,857.70; Park ave. to country road, \$13,450; total, \$32,307.70.

South Bend, Ind.—For paving and sidewalks as follows: Brick paving in alley west of Michigan st., Hoban & Roach, 317 N. Emerick st., \$749.95; curbing and constructing sidewalks in Marietta and Fellows sts., Thos. M. Bauer, 704 Coquillard st., \$897.42 and \$348.90, respectively.

South Bend, Ind.—For improving So. Michigan st., between Ewing ave. and Leeper rd., with stone macadam pavement, to C. H. Defreese, at 83c. per ft.

Terre Haute, Ind.—To Greenleaf Construction Co., at \$2,324, for improvement of Plum st.

Clinton, Ia.—By city for paving 2d st. to P. V. Clarke.

Des Moines, Ia.—By City, for construction of brick pavement, to the Turner Construction Co., as follows: Intersection 20th and Olive, \$2,31; 9th, between M. & St. L. and Q. tracks, \$2.14.

Des Moines, Ia.—By City, for asphalt paving, to Bryant-McLaughlin Co., as follows: West 9th, from Grand ave. to Center st., \$1.90; Otk Park ave., from 6th to 8th st., \$1.62; West 26th, from Cottage Grove to Kingman, \$1.58; West 37th, from University to Kingman, \$1.62; West 4th, from Indiana to Forest and Forest from 4th and 5th, \$1.58.

Eldora, Ia.—By City Council to Dearborn & Jackson Co., Cedar Rapids, Ia., for 4 blocks of cement concrete paving.

Sioux City, Ia.—To Jensen & Krage, for constructing sidewalk on Dodge st. and for constructing combined cement curb and gutter in various streets.

Atchison, Kans.—To Atchison Paving Brick Co., at \$22,932, for brick paving on Kearney st.

Leavenworth, Kans.—For street improvements as follows: 11,180 sq. yds. brick paving, O. C. Chapin, care city engineer, \$16,828.94; 20,000 sq. yds. asphalt paving, J. R. Ramsay, Topeka, Kans., \$23,850; 5,760 ft. concrete curbing, Fred. Tarry, care city engineer, J. H. Kirmayer, cy. clk.; Jas. O'Neil, cy. engr.

Midway, Ky.—By City Council, for construction of concrete sidewalks by J. Warren Smith, of Versailles, at 13 1/4c. per sq. ft. for sidewalks and 20c. for crossings.

Carencro, La.—To A. E. Massicot, La-Fayette, for construction of 35,000 sq. ft. of cement walks.

Detroit, Mich.—By Common Council, as follows: To Julius Porath, 34 McGraw Bldg., Abbott st. and Hooker ave., \$19,543; to T. E. Currie, 20 McGraw Bldg., Hibbard and Lillibridge ave., \$12,976; to F. Porath

& Son, 301 Penobscot Bldg., with cedar block, Lockwood ave., for \$8,088.

Grand Rapids, Mich.—By Council, for paving Court st. with asphaltic concrete, to Hilding & Whiting, at \$1,400.

Hillsdale, Mich.—By city for 10,500 sq. yds. of brick paving to Farrell Bros. at \$1.80 per sq. yd.

Ishpeming, Mich.—By Marquette County Road Commissioners to J. E. Blomgren, Norway, for building 10 miles of earth road.

Lake Linden, Mich.—By Common Council, for paving Calumet ave., to D. C. Tabor, of Chicago, Ill., for \$12,000.

Pontiac, Mich.—For paving with asphalt S. Saginaw st., to Cleveland Trinidad Asphalt Co., of Cleveland, at \$1.39 per sq. yd., or a total of \$26,819.

St. Joseph, Mo.—By Board of Public Works, for paving July st., 26th and 27th sts., with asphalt, to Metropolitan Paving Co.

Great Falls, Mont.—To Nilson-Smith Co., for paving with carbolineum-treated blocks, portion of 4th st., for \$5,862.

Kalispell, Mont.—To Two Miracles Co., for paving 1st ave., for \$19,632.

Aurora, Neb.—By City Council, for paving streets and alleys around public square, to M. Ford, of Council Bluffs, for about \$41,000.

Asbury Park, N. J.—By City Council, for paving Main st. with Saxton brick, to United Paving Co., at \$2.29 per sq. yd.

Burlington, N. J.—By road committee of Burlington County Freeholders to E. C. Humphrey & Company, of Hackensack, to resurface stone road from Rancocas Park to Hainesport drawbridge on bid of \$6,359.73.

Mickleton, N. J.—By Gloucester County Freeholders at Woodbury, for new road from Mantua Grove to Mickleton, to the Filbertine Constr. Co., of Philadelphia, for \$51,075.

Union, N. J.—By Town Committee, for curbing and laying sidewalks in Saybrook, to F. Leonard Stone Co., at \$3,105.61. Other bids as follows: Reilly Stone Co., of Newark, \$3,319.10, and Middlesex Stone Co., of Newark, \$3,795.56.

Brooklyn, N. Y.—By City as follows: For regulating and grading in Fillmore ave. from Junction ave. to 48th st. to Reasner Construction Co., \$4,011.20. For regulating and grading Boulevard from Washington ave. to Broadway, to Atlanta Construction Co., \$26,280. For repaving with granite blocks on concrete foundations in Metropolitan ave. from Helen st. to Montauk Division of Long Island Railroad, to C. A. Myers, \$34,791.50. For repaving with improved granite blocks on prepared macadam foundation in Jackson ave. from westerly side of Shell rd. to Flushing River, to H. J. Mullen Construction Co., \$31,474.

For paving with improved granite blocks on prepared macadam foundation in Broadway from Murray lane to 10th st., Bayside, to Henry J. Mullen Construction Co., \$126,425. For repaving with asphalt concrete on macadam foundation in Lawrence st. and College Point Causeway from a point 500 ft. north of Broadway to 13th st., to Standard Bitulithic Co., \$17,504. For repaving with asphalt concrete on macadam foundation in Cooper ave. from Myrtle ave. to Montauk Division of Long Island Railroad, to Uvalde Construction Co., \$4,600. For repaving with asphaltic cement on macadam foundation in Woodhaven ave. from Jamaica ave. to Forest Park Driveway, to Barber Asphalt Co., \$6,216.

For repaving with asphaltic cement on macadam foundation in Hempstead and Jamaica Turnpike from Grand st. to Harvard ave., to Barber Asphalt Co., \$9,851.50. Repaving with asphaltic concrete in Merrick rd. from Fulton st. to point 1,500 ft. of Central ave., Springfield, to Continental Public Works Co., \$17,490.

Lockport, N. Y.—By City, for cement sidewalk on east side of Locust st., to Hiram Hornby.

Schenectady, N. Y.—By Board of Contract and Supply, for grading Wanmer st., to Miller Bros., at 34c. per cu. yd.

Syracuse, N. Y.—To John C. Healey for construction of Bessemer brick pavement and vitrified tile sewer in Seminary ave., and also for construction of masonry work for abutments of new Lizette st. bridge.

Delaware, O.—By board of commissioners of Delaware county to J. M. Richey, R. F. D. No. 6, for construction of Crandall macadam road, 4 miles in length.

Grard, O.—By Village Council, for improving Liberty st., to Olson & Turner, of Youngstown, at \$16,124.50.

Franklin, Pa.—By Council, for paving of Chestnut st., to Anderton & Lamb, at \$5,469.50.

Franklin, Pa.—By Council, for paving of Orchard st. and First alley, to Pierce & Hinderliter, at \$1,880.60, and \$2,004.80; also for paving of W. 2d st., at \$2,516.69.

Franklin, Pa.—By Council, for paving of Read st., to J. M. Leshner, at \$6,514.70.

Oil City, Pa.—By City, for paving Reed st., with Mack brick, to J. M. Leshner, at \$6,305.10.—G. F. Roess, C. E.

Reading, Pa.—By Board of Public Works, for paving Court st., to John K. Foust, at \$2.05 per sq. yd.

Reading, Pa.—By City, for paving with brick following alleys, to Auburn Brick Co.: Alley running south from Washington st., between Reed and 7th; alley running south from Buttonwood st. east of 8th st.; alley running southwest from Cedar st. south of Buttonwood st.; alley running east of 9th st. south of Penn st.; alley running north of Cherry st., east of 9th st., and alley running north from Muhlenberg st. east of Miller st.

York, Pa.—By State Highway Commissioner for construction of 3,708 ft. of good roads in Glen Rock, to Continental Public Works Co., of New York City, at \$14,221.46.

Longview, Tex.—By city council for street paving to Roach & Monigon of Memphis at \$60,000.

Seattle, Wash.—By City, for grading 35th ave. Southwest, to P. J. McHugh, \$77,668.00. North side of Jackson st. and 5th ave. South, removing slide, to W. H. Marks, earthwork, \$2,200; filling, \$1,700. Brandon st., grading and curbing, to Andrew Peterson & Co., \$66,710.50.

Spokane, Wash.—By City, for paving Wall st., to Inland Empire Hassam Paving Co., at \$11,628.

Racine, Wis.—By Common Council, for paving Owen ave. with California asphalt, Malta brand, to Western Improvement Co., at \$1.50 per sq. yd. for paving, and 67c. per lin. ft. for curb and gutter.

SEWERAGE

San Francisco, Cal.—Finance Committee of Board of Supervisors has approved of request of Board of Public Works for appropriation of \$240,000 for sewer and street work.

Santa Monica, Cal.—Election will be held Sept. 12 for voting on \$52,900 bond issue for sewers, storm drain and fire department.

Willows, Cal.—In bond election voters of Sewer District No. 2 decided by vote of 130 to 23 to issue bonds of \$27,000 to build new sewer system.

Windsor, Conn.—Town meeting will be held for discussing installation of sewer district.

Washington, D. C.—Extensive improvements will be made in sewer system.

Quincy, Ill.—Resolution has been adopted for laying of Hampshire st. sewer.

Tampa, Fla.—City Council is considering question of calling election to vote on issue of bonds as follows: For sewerage, \$250,000; purchase of water works plant, \$500,000; street paving, \$700,000 new city hall, \$200,000; new park sites, \$50,000; temporary city docks on the estuary, \$50,000.

Belvidere, Ill.—Ordinances have been passed for extensions of sanitary sewer system in Division, 4th, 3d and 10th sts., at cost of \$3,850; also in Fremont st., at \$800, and Prairie st., at \$800.

South Bend, Ind.—Resolution has been approved of for installation of sewer on East Wayne st.

Council Bluffs, Ia.—Plans are being prepared for 10,000,000-gal. concrete-lined settling basin. Bids will shortly be received.

Des Moines, Ia.—East Des Moines asks that septic tank be built to improve sewerage system in far eastern parts.

Seneca, Kan.—Bids will shortly be received for sanitary sewers and sewage disposal works; estimated cost, \$50,000.

California, Mo.—Plans and specifications are being completed for sanitary sewers. Approximate cost of the improvements, \$50,000.

Montgomery, Mo.—City Council has called election to vote on \$20,000 bond issue for building sewerage and water works system.

Beverly, N. J.—Election will be held for voting a proposition to sewer city at cost of \$40,000.

Elizabeth, N. J.—Board of Health has recommended Council to lay sewers from Irving to Monroe sts.

Garwood, N. J.—Borough Council has decided to lay 140 ft. of sewer pipe in Centre st.

Jersey City, N. J.—Erection of sewage disposal plant below dam at Boonton is being discussed.

Plainfield, N. J.—Ordinance has been passed providing for construction of further addition to system of sewerage.

Trenton, N. J.—City will construct sewers in old part of municipality.

Binghamton, N. Y.—Ordinance will be introduced in Common Council providing for storm water sewer system in north side.

Newburgh, N. Y.—Construction of sewers of vitrified pipe on Broadway and Water sts. have been recommended.

Rochester, N. Y.—Common Council is considering ordinance for new sewer in West ave. at estimated cost of \$30,000.

Rochester, N. Y.—Ordinances have been passed providing for Kipling pl. sewer, \$375; Heidelberg st. sewer, \$1,200, and Pomeroy st. walks and sewer, \$5,300.

Cincinnati, O.—Resolutions have been passed for extensive sewer extensions.

Cincinnati, O.—Following bond issues have been authorized: \$18,280, for relief sewers in Linwood ave., Observatory ave., Erie ave. and Shady la.; \$12,500 for sewers in Montana ave., Hazelwood ave., Epworth ave., Cheviot ave., Daytona ave. and in the right-of-way west of Boudinot ave.; \$52,000, for sewers in Wardall ave., Epworth ave., Feltz ave. and in ravine and right-of-way east of Woodburn ave., from Lexington ave. to Bloody Run sewer; and in Amthauer st., Pinetree st. and in unnamed alley, Irwin st. and in right-of-way, Sturgis ave. and right-of-way, Stephenson alley, Southside ave., Mozart ave. and Higbee st., Montgomery rd., Knically alley, Mead ave., Donham ave. and Congress ave.; Mathers st., Altoona st. and Walter ave., Fredonia ave., Melbourne st., Dellway st. and right-of-way; Chickasaw st., right-of-way from trunk sewer west of Douglas ave. into Norwood sanitary sewer and in Edwards rd.; Halstead st., Hukill alley, right-of-way along canal from Addison st. to Straight st., Bush alley, Price ave. and Purcell ave.; Koltman st., Boudinot ave. and Urweiler ave.; Boudinot ave., from Daytona ave. to trunk sewer north of Werk rd. and Lischer ave.; \$3,000, to pay cost of improving Bathgate st., from Omaha st. to Melish ave.; \$21,000, for repairs of bridges and viaducts; \$1,300 for concrete steps in Seegar alley, from Westwood ave. to Esmond st.; \$2,200, for improving Hickory st., from Burnet ave. to Harvey ave.; \$2,500, for improving Jay st., from Hickory st. to Maple ave.; \$800, for improving Brackett alley, from 13th st. to its northern terminus; \$1,000, for improving Ernst alley, from Bernard st. to Buck st., and Evans alley, from Harrison ave. to Ernst alley; \$2,900, for concrete steps in Peete st., from Vine to Mulberry sts.; \$6,000, for concrete steps in Young st., from Milton to Pueblo sts.; \$1,100, for improving Phoenix alley, from Baymiller st. to Arthur alley; \$1,500 for concrete steps in Hughes st., from Mulberry st. to 53 ft. south; \$1,000, for improving Bent alley, from David st. to Bauer ave.; \$2,000, for improving Alice st., from Charlton st. to Daniels st.; \$2,000, for improving Frank st. from Schenck alley to Liberty st.

Pleasant Ridge, O.—Citizens have voted in favor of issuing \$20,000 of bonds for construction of sewage disposal plant.

Sebring, O.—City Council has passed ordinance for constructing sewers in portions of sundry streets.

Springfield, O.—City is considering erection of sewage disposal plant.

Springfield, O.—Ordinance has been passed authorizing laying of sewer from North Main st. to Orange st.

Youngstown, O.—Plans for Lincoln Park district sewer have been prepared.

Youngstown, O.—District sewer will be built in East End north on Sheby st.

Ardmore, Okla.—Bond issue of \$50,000 is being considered for sinking deep wells for augmenting water supply.

Portland, Ore.—Extension of water mains in various streets has been authorized; estimated cost, \$17,000.

Altoona, Pa.—Plans will be prepared for diversion of waters of Ginter's Run and laying of sewers in Fifth Ward.

Altoona, Pa.—City Engineer Engstrom has advertised for bids for construction of sewer in 11th ave., between 11th and 12th sts., and one in 11th alley, between 21st and 23d sts.

Beaver Falls, Pa.—College Hill Council has decided to install sewer system to cover entire borough from Ft. Wayne Railroad on west to Morado on north, Beaver River on east and 26th st. on south.

Carlisle, Pa.—Plans have been prepared for disposal plant of sewerage system to cost about \$99,000.

Erie, Pa.—Ordinance has been passed instructing city engineer to advertise for proposals for 9-in. sewer in Short st. 600 ft. west.

Harrisburg, Pa.—Plans for gigantic sewerage system, including disposal plant, are being made by Middletown Drainage Co.

So. Bethlehem, Pa.—Ordinance has been passed authorizing issue of bonds for storm sewer construction.

Sioux Falls, S. D.—Election will be held Sept. 26 for voting on bond issue of \$200,000 for establishing system of trunk sewers.

Sioux Falls, S. D.—Election will be held Sept. 26 for voting on \$200,000 bond issue for construction of sewerage system.

Sioux Falls, S. D.—Council is considering election for voting on \$300,000 bond issue for construction of sewer and completion of water plant.

Watertown, S. D.—Election will be held

Aug. 28 for voting on borrowing \$11,000 to be expended in constructing storm sewer.

Abilene, Tex.—Voters have authorized issuance of \$20,000 bonds for new water site.

Cleburne, Tex.—Plans and specifications have been completed for sanitary sewers and sewage disposal; estimated cost, \$200,000.

Dallas, Tex.—Bids will be advertised for laying of storm sewers in Harwood and Live Oak sts.

Houston, Tex.—Property owners are petitioning for lateral sewer to be constructed on Nance st. to Sterrett.

La Grange, Tex.—Installation of modern sewer system is contemplated.

Rockdale, Tex.—Plans are about completed for sewerage system.

Seattle, Wash.—Ordinance has been passed authorizing issuance of bonds for improvement of Woodlawn ave. by constructing sewers.

CONTRACTS AWARDED

Torrington, Conn.—For construction of section of sewerage system for McKinley st. outfall, east side outfall in Wall st. and 8-in. lateral in Millard st., to H. S. Driscoll & Co., at \$5,750.26. Other bids as follows: O'Neil Bros., \$7,429; Conti & Co., \$7,393.15; Rossi, \$7,214.06; Marcetti & Holley, \$8,628.71; Silvester, \$6,283.93.

Washington, D. C.—To Warren F. Brenzler Co. for constructing sec. 1 of the Anacostia sewer.

Arlington Heights, Ill.—By Board of Local Improvements, to Lanyon & Clifford, Waukegan, Ill., at \$74,626.35, for construction of system of sewers and purification works.

North Chicago, Ill.—To William Moran & Co., Joliet, Ill., at \$45,510.75, for construction of sanitary sewer system for North Chicago.

Pella, Ia.—By City, for constructing 15,000 ft. sewers, to H. J. Cathroe, of Omaha, Neb., for \$13,909.

Hallowell, Me.—For constructing ravine sewer, to James H. Kerr, of Rumford Falls, for \$4,132.

Milford, Mass.—To Cendella & Co., to Sec. 8 of sewer system, for about \$22,306.

Westfield, Mass.—To Ablett & Bowles, Cohoes, N. Y., at \$5,400, for laying 1½ miles of sewer.

Grand Rapids, Mich.—By Board of Public Works for east side trunk sewer pumping station foundation and superstructure to C. W. Bunker & Co.

Grand Rapids, Mich.—By Board of Public Works for sewer on Trowbridge st. to Meyer & Van Oeren at \$124.52; North Ottawa st. sewer to Ver Hey & Kloote at \$1,694.05.

St. Joseph, Mo.—By Board of Public Works, for two district sewers, to Skilbred Construction Co.

Garwood, N. J.—For laying sewer pipes at South ave., Willow and Spruce aves., to E. W. Chamberlain, of Westfield, at \$1 per ft.

Paterson, N. J.—By Board of Works, for sewers as follows: Section B, McKiernan & Bergen, \$14,081.77; Section D, Frank Puglic, \$4,076.40; Section E, Union Building & Construction Co., \$25,000; Section F, Union Building & Construction Co., \$20,860.35; Section G, Union Building & Construction Co., \$7,987.10.

New Rochelle, N. Y.—For construction of sewers in North ave., from Eastchester rd. to Broadview, to Rochelle Construction Co., of New Rochelle, N. Y.

Schenectady, N. Y.—To Kaltean-Frank Co., for laying sewers in Vischers, 5th and Oakwood aves.

Ada, O.—By Hardin County Commissioners to Hounker & Williams, at \$26,458, for construction of Ada sewer ditch.

Ada, O.—By County Auditor at Kenton, for constructing the Ada Sewer Ditch, requiring 4250 lin. ft. 48-in. brick sewer, 3260 lin. ft. 30-in. and 900 lin. ft. 18-in. sewers, to Van Meter Constr. Co., of Kenton, for \$26,000.

Eddystone, Pa.—By Borough Council, for laying sewers in Eddystone to Contrell Construction Co.

Lebanon, Pa.—By City, for outfall sewer and disposal plant, to Bennet & Sons, of Indiana, Pa., at \$45,458.25.

Lebanon, Pa.—By City, for constructing main sewer system, to Bennett & Randall, of Greensburg, at \$53,866.25. Other bids as follows: H. C. Brooks, amount under per foot front rule, exclusive of branch sewer, \$64,986.65; for branch sewer, \$13,347.75; total, \$78,334.40; house connections, tentative, \$21,492; Contrell Construction Co., \$44,236.87; branch sewer, \$9,644; total, \$53,880.87; house connections, tentative, \$14,072.50; Bennett & Randall, \$44,402.95; branch sewer, \$9,463.30; total, \$53,866.25; house connections, tentative, \$15,648.

Seattle, Wash.—By City, for laying sewers on 32d ave., to Frasca & Coluccio, at \$20,700.94.

WATER SUPPLY

East Bakersfield, Cal.—Trustees are considering plan for increasing water supply.

Oakland, Cal.—Bids will be readvertised for construction of water plant for watering county road No. 818; surveyor's estimate was \$8,300.

Washington, D. C.—Importer of machinery and tools in Far East would like to correspond with American manufacturers and exporters of iron pipe of various sizes, from 1 in. to 12 in. in diameter. No. 7230, Bureau of Manufacturers.

Wilmington, Del.—Board of Water Commissioners is considering installation of water-driven pumps along Brandywine to use surplus water.

Mounds, Ill.—Council has decided to install municipal water system.

Tampico, Ill.—Installation of water works system is being considered.

Algona, Ind.—City Council has authorized issue of bonds for enlarging and improving municipal water and light plant.

South Bend, Ind.—Board of Public Works is considering best method of utilizing pure water from wells in East Mishawaka.

South Bend, Ind.—Plans are being prepared for pumping machinery, power house and other water works improvements; estimated cost, \$300,000.

Arthur, Ia.—Bond issue of \$6,000 has been voted for construction of water works.

Council Bluffs, Ia.—High-pressure electric pump will be installed in Broadway station of city water works plant; bids for same will be called for shortly; estimated cost, \$30,000.

Donnellson, Ia.—Installation of water works system is being considered.

Chapman, Kan.—Burns & McDonnell, Scarritt Bldg., Kansas City, are preparing plans for system of water works; cost, \$20,000.

Mound City, Kan.—Bids will soon be received by City Clerk for improvements to water works system, to cost \$25,000.

Valley Falls, Kan.—Bond election has been ordered for new water supply and water works improvements. Water supply will be taken from springs. Estimated cost, \$35,000.

Valley Falls, Kan.—Engineers Burns & McDonnell, Scarritt Bldg., Kansas City, are preparing plans for improvements to water works system; cost, \$40,000.

Wichita, Kan.—Plans, estimates and valuation of water works plant are being made.

Williamsburg, Ky.—Election will be held in November for voting on \$30,000 bond issue for water works system.

Kentwood, La.—Installation of water works system has been decided.

Monroe, La.—Plans are being made to put in new water mains for entire water system, together with laterals every 50 ft.; estimated cost, \$75,000.

New Orleans, La.—Extension of water mains through Gentilly Terrace is being considered; estimated cost, \$20,000.

Saginaw, Mich.—Board of Water Commissioners have recommended construction of pumping station and engines together with filtration plant.

Bethany, Mo.—Plans and specifications have been completed for water works improvements. Bond election for \$30,000 has been ordered.

Kirkwood, Mo.—Election will be held Aug. 19 to vote on question of issuing \$10,000 of bonds to improve and extend water service.

Linneus, Mo.—Plans will probably be considered for installation of water works system.

Montgomery, Mo.—City Council has called election to vote on \$20,000 bond issue for building water works and sewerage system.

St. Joseph, Mo.—Ordinance has been passed ordering St. Joseph Water Co. to lay mains on 20th st. from Messanie st. and erect fire hydrants thereon.

Cascade, Mont.—Engineers are preparing plans for water works system.

Omaha, Neb.—Voters have decided to issue \$20,000 in bonds for installation of water works system.

Jersey City, N. J.—Street and Water Board has voted to ask Board of Finance to appropriate \$150,000 for new water mains.

Long Branch, N. J.—By City, for furnishing machinery to be used at water plant, to Ingersoll Rand Co., at \$4,998.

Millville, N. J.—Finance Committee has decided to employ engineer to ascertain approximate cost of water works plant.

Newark, N. J.—City will purchase plant of the Orange Water Co.

Churchville, N. Y.—Question of water works is being considered, but election for same will probably not be held before spring.

Fort Ann, N. Y.—Bond issue of \$35,000 has been voted for water supply system.

Schenectady, N. Y.—Ordinance authoriz-

ing construction of water mains in Notter, Bradley and Hamilton sts. has been approved.

Largo, N. D.—Bids will be readvertised for construction of pump house, etc., for filtration plant.

Springfield, O.—City will purchase pumping machinery for municipal water works.

Stillwater, Okla.—Voters have authorized issuance of \$15,000 for water works extension.

Hermiston, Ore.—Bond issue of \$25,000 has been voted for construction of municipal water works system.

Myrtle Creek, Ore.—Council has voted in favor of municipal water and lighting systems.

Vermillion, S. C.—Voters have decided to issue \$32,000 of bonds; \$16,000 toward purchase of present water system and \$16,000 for betterments and additions, including wells, new 100,000-gal. tank, new pumps and engines and other improvements.

Lemmon, S. D.—Council has received petition for installation of reservoir with capacity of 100,000 gal.

Sioux Falls, S. D.—Election will be held Sept. 26 for voting on \$100,000 bond issue for extensions to municipal water works system.

Sioux Falls, S. D.—Council is considering election for voting on \$300,000 bond issue for completion of water plant and construction of sewer.

Cleburne, Tex.—Plans and specifications have just been completed for new municipal water works plant and bond election has been ordered; estimated cost, \$220,000.

Cleburne, Tex.—Burns & McDonnell, Scarritt Bldg., Kansas City, engineers, are working on water works appraisal.

Hillsboro, Tex.—Bond issue of \$15,000 has been voted for extending and improving water works system.

Houston, Tex.—City will install pumping station for new filtering beds.

Mission, Tex.—Voters have authorized \$15,000 bond issue for construction of water works and distributing system.

Asotin, Wash.—Election will be held Aug. 29 for voting on bonding town for \$35,000 for municipal water works.

Centralia, Wash.—Citizens are discussing advisability of installing municipal water plant.

Manitowoc, Wis.—By vote of 870 to 71 in special election City ratified action of Common Council in issuing \$230,000 municipal bonds for purchase of plant of Manitowoc Water Works.

CONTRACTS AWARDED

Pana, Ill.—For furnishing material and improving water works divided in 7 sections, as follows: Reservoir dam and pump tower; water pipe and transmission line; pumping machinery; mechanical filter plant; gas-power electric plant; power house; steam boilers, engine and generator from plans of Arthus Geisler, of Dayton, O., to O. T. Dunlap, of Edwardsville, for \$46,000.

Crown Point, Ind.—To A. Rader, at \$842, for 1,200 ft. of 4-in. water main extension.

Harlan, Ia.—By City Council, for \$3,000 ft. 8, 10, 12 and 15-in. vitrified sewer, to Lana Construction Co., for \$7,977. Other bidders: E. L. Dimick, Lane, Neb., \$9,082; E. S. Sykes, Minneapolis, Minn., \$8,858; Garberick & Anderson, Sheldon, Ia., \$8,528; Hoar & Parkinson, Iowa City, Ia., \$8,256; G. S. Redmond, Pipestone, Minn., \$8,186, and M. A. Camery, Harlan, \$8,045.

Prairie City, Ia.—To Little & Gill Hardware Co. for extending water mains.

Pittsfield, Mass.—By Board of Public Works, for laying water pipe in towns of Lenox and Washington, to Albert O. Bulard, of Sterling, for \$4,774. Other bidders: Golden & Pidgeon, of Troy, \$5,074; M. F. Camarco, of Lee, \$6,291; Henry Spinachi Contracting Co., of Waterbury, Conn., \$9,296; John E. Palmer, of Boston, \$6,226.50, and Angelo Conti & Co., \$8,938.—A. B. Farnham, Chief Engineer, Board of Public Works, Pittsfield.

Bird Island, Minn.—To Frank Korst, for constructing water mains and hydrants.

Duluth, Minn.—By Board of Water and Light Commissioners, for west and hillside extension to S. Johnson & Erick Nordquist & Co., at \$15,283.20. Other bids were: Charles Eklund, \$15,976.80; George R. King, \$16,169; Pastoret Lawrence Co., \$16,775.60; E. Engle, \$17,315.80; Fairbanks, Morse & Co., \$18,781; C. S. Prosser & Co., \$19,634.

Irvington, N. Y.—For furnishing and laying about 12,000 ft. 12-in. c.-i. water pipe, to Partridge & Burk, of Lodi, N. J., for \$24,303.

Suffern, N. Y.—For installing water sterilization plant and mechanical pressure filter from plans of Alex. Potter, 114 Liberty st., New York City, to M. L. Bayard & Co., of Philadelphia, Pa., for \$1,950.

Cincinnati, O.—To N. Ruebel, for laying 6-in. water pipe, setting fire hydrants,

valves and special castings in Woodbine ave., from Glenmore to Davis ave., Cheviot. Hollis, Okla.—By City, to Kennedy & Fleming, of Oklahoma City, Okla., for construction of water system.

Waynoka, Okla.—To Oklahoma Engineering Co., Anadarko, at \$24,475, for construction of water and electric light system.

Erie, Pa.—For furnishing 1,200 tons of 6 and 12-in. pipe, by Board of Water Commissioners, to U. S. Cast Iron Pipe & Foundry Co., 957 East Ferry st., Buffalo, N. Y., the lowest bidder, at \$21.70 per ton and \$50 per ton for special castings.

Glen Rock, Pa.—By Borough Council, for cementing and enlarging reservoirs and drilling an artesian well as follows: Reservoirs, to G. A. & F. M. Wagman, of Dalls-town, Pa., at \$5,200; drilling well, to Central Construction Co., of Harrisburg, Pa.

BIDS RECEIVED

Muskogee, Okla.—For about 2000 meters: Standard Meter Co., of New York, N. Y., \$19,950; Hersey Mfg. Co., of Boston, Mass., \$13,500; Thompson Mfg. Co., of New York, N. Y., \$18,000; Buffalo Meter Mfg. Co., of Buffalo, N. Y., \$13,500; Budger Meter Mfg. Co., of Kansas City, Mo., \$12,900; Union Water Meter Co., of Worcester, Mass., \$15,000; Pittsburg Meter Co., of Pittsburg, Pa., \$18,900; Henry R. Worthington Co., of New York, \$17,000; National Meter Co., of New York, N. Y., 2 bids on different types of meters, total of both bids, \$29,000.

LIGHTING AND POWER

Eufaula, Ala.—Question of floating bonds for purpose of securing funds to build municipal lighting plant is being discussed.

Colusa, Cal.—Supervisors have granted franchise to Northern California Power Co. to supply Williams with light and power.

Paleus, Cal.—Installation of street lighting district has been decided.

Sacramento, Cal.—City Trustees have adopted design for electroliners to be placed on Sacramento business streets under direction of Retail Merchants' Association. Specifications for installation of electroliners have been submitted to City Trustees.

Pueblo, Colo.—Pueblo Gas & Fuel Co. have applied to the City Council for extension of its franchise for period of 25 years.

Augusta, Ga.—Street Lighting Committee of City Council has decided on flaming arc lamps for Broad st.

La Salle, Ill.—Installation of new lighting system extending from Rock Island depot to Illinois Central Station is contemplated.

Algona, Ind.—City Council has authorized bond issue for enlarging and improving municipal light and water plant.

Gary, Ind.—Franchise has been granted for 25 years by Board of Public Works to T. B. Dean, of Chicago, for control heating plant.

Lecompton, Kan.—Voters have decided on \$2,500 bond issue for purpose of installing electric light plant.

Ness City, Kan.—Voters have decided to issue \$16,000 in bonds for purpose of rebuilding electric light plant, recently destroyed by fire.

Baltimore, Md.—Plans have been completed for lighting of boulevard and University Parkway.

Boston, Mass.—Electric lighting plant in City Hall annex is being considered.

Bay City, Mich.—Electric Light Committee has been authorized to advertise for bids changing lights on west side from open arc lights to metallic flame lights; estimated cost, \$7,500.

St. Paul, Minn.—Bids are being asked on street lighting and lamp equipment.

Millville, N. J.—Finance Committee has decided to employ engineer to ascertain approximate cost of electric light and water plants.

Binghamton, N. Y.—Election will be held for determining whether \$20,000 shall be raised to remove wires and poles from Court st. and establish conduits.

Kenmore, N. Y.—Two gas companies are petitioning for franchises to supply village with natural gas.

Springfield, O.—Council has authorized bond issue of \$2,000 for installation of street lights, both arc and gas, for new additions to city.

Eugene, Ore.—Proposition has been made by Oregon Power Co. to take over city power plant.

Klamath Falls, Ore.—F. W. Boardman Company, of San Francisco, will probably get franchise for gas plant in this city.

Myrtle Creek, Ore.—Council has voted in favor of lighting and water system.

Spokane, Wash.—Mains of Spokane Fal's Gas Light Co. will be extended to Hillyard at cost of \$50,000.